OKIDATA®

Service Manual

ML320/ML321
Dot Matrix Printers

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09/17/97

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Manual Part Number and Revision

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1.1 GENERAL DESCRIPTION

The Microline 320 and Microline 321 are nine pin, dot matrix printers. Two versions of the printers are available. The first provides Microline emulation. The second version provides Epson and IBM Proprinter emulations, which are selected through the Printer Menu.

The major difference between the Microline 320 and Microline 321 is the width of each printer. The Microline 320 can handle 80 print columns (at 10 CPI). The Microline 321 can print up to 136 columns (at 10 CPI).

The standard interface is a Centronics parallel and an optional RS232-C serial interface can be installed. The optional serial interface can transfer data at speeds up to 19.2K baud.

Both printers feature an enhanced operator panel which provides access to the following capabilities.

Menu Selection
Quiet Mode
Printer Tests
Paper Park
Print Characteristics
Standard Printer Controls

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1.1.02 Serial Number Identification & (A-D) Revision Levels

A
Rev A units are original production units. An interconnect module connects the power supply board to the main control board.

B
Rev B units are retrofitted to include a modified interconnect module, which prevents corrosion.

C
Rev C units have a cable harness connection between the power supply board and the main control board. The cable harness replaces the interconnect module.

D
Rev D units have no power supply board. The circuitry for the power supply board has been incorporated on the main control board.

Please Note the following:
The Rev C main control board (LXMC) and power supply board (SUII) are downward compatible with Rev A and B units.

The Rev A and Rev B main control board (LXMC) and power supply board (PAII) cannot be used in Rev C units.

Rev D units do NOT use Rev A, Rev B, or Rev C main control boards, transformers, operator panels, upper covers, and lower covers. Rev D units have a unique main control board (LXMR), no power supply board, a 50 volt transformer, and a unique operator panel (LXON).

NOTE:
Please refer to the parts lists (Appendix B()) for parts differentiation. Please be sure of the parts you need before ordering to avoid confusion and incorrect parts orders.

Printer Serial Number Identification
There are four serial number revision levels for the Microline 320 and 321 printers. Hardware differences exist between levels. To identify the revision level of a printer, record the serial number from the back of the printer. **Refer to the following to decode the serial number.**

Example Printer Serial Number: 401D0154693

Date Code	**401 (4 = year. 01 = month)**
Revision	**D**
Serial Number	**0154693**

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
LXMC Board	55041411	Main Control Board	Yes	Yes	No	No
LXMC-3 Board	55041412	Main Control Board	Yes	Yes	Yes	No
LXMR	55075111	Main Control Board (with SSD)	No	No	No	Yes

Power Supply Board

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
PAII-2 Board	55039902	Power Supply Board	Yes	Yes	No	No
SUII-2 Board	55047402	Power Supply Board	Yes	Yes	Yes	No
N/A	N/A	Power supply function included on the Main Control Board	No	No	No	Yes

Operator Panel Assembly

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
LXSP-2	55038602	Operator Panel Board	Yes	Yes	Yes	No
LXON	55075011	Operator Panel Board (with SSD)	No	No	No	Yes
N/A	50069603	Operator Panel Bezel	Yes	Yes	Yes	No
N/A	50107426	Operator Panel Bezel (with SSD)	No	No	No	Yes

Transformer

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
120 Volt XFRMR	56407503	Transformer - Microline 320	Yes	Yes	Yes	No

120 Volt XFRMR	56407502	Transformer - Microline 321	Yes	Yes	Yes	No
120 Volt XFRMR	56413201	Transformer - Microline 320 (with SSD)	No	No	No	Yes
120 Volt XFRMR	56413202	Transformer - Microline 321 (with SSD)	No	No	No	Yes

Interconnect Module

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Interconnect Module	55328301	Connects power supply board to main board	Yes	Yes	No	No

Cable

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cable	56616802	Connects power supply board to main board	No	No	Yes	No

Cable Guide

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cable Guide	51003801	Holds cable in place	No	No	Yes	Yes

Covers

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cover	53488302	Middle Cover - Microline 320	Yes	Yes	Yes	No
Cover	53488402	Middle Cover - Microline 321	Yes	Yes	Yes	No

Cover	53070701	Middle Cover - Microline 320 (with SSD)	No	No	No	Yes
Cover	53070801	Middle Cover - Microline 321 (with SSD)	No	No	No	Yes

Chassis

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Chassis	50061101	Middle Cover - Microline 320	Yes	Yes	Yes	No
Chassis	50061201	Middle Cover - Microline 321	Yes	Yes	Yes	No
Chassis	50104501	Middle Cover - Microline 320 (with SSD)	No	No	No	Yes
Chassis	50104601	Middle Cover - Microline 321 (with SSD)	No	No	No	Yes

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Compatibility Chart

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
LXMC Board	55041411	Main Control Board	Yes	Yes	No	No
LXMC-3 Board	55041412	Main Control Board	Yes	Yes	Yes	No
LXMR	55075111	Main Control Board (with SSD)	No	No	No	Yes

Power Supply Board

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
PAII-2 Board	55039902	Power Supply Board	Yes	Yes	No	No
SUII-2 Board	55047402	Power Supply Board	Yes	Yes	Yes	No
N/A	N/A	Power supply function included on the Main Control Board	No	No	No	Yes

Operator Panel Assembly

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
LXSP-2	55038602	Operator Panel Board	Yes	Yes	Yes	No
LXON	55075011	Operator Panel Board (with SSD)	No	No	No	Yes
N/A	50069603	Operator Panel Bezel	Yes	Yes	Yes	No
N/A	50107426	Operator Panel Bezel (with SSD)	No	No	No	Yes

Transformer

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
120 Volt XFRMR	56407503	Transformer - Microline 320	Yes	Yes	Yes	No
120 Volt XFRMR	56407502	Transformer - Microline 321	Yes	Yes	Yes	No
120 Volt XFRMR	56413201	Transformer - Microline 320 (with SSD)	No	No	No	Yes
120 Volt XFRMR	56413202	Transformer - Microline 321 (with SSD)	No	No	No	Yes

Interconnect Module

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Interconnect Module	55328301	Connects power supply board to main board	Yes	Yes	No	No

Cable

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cable	56616802	Connects power supply board to main board	No	No	Yes	No

Cable Guide

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cable Guide	51003801	Holds cable in place	No	No	Yes	Yes

Covers

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cover	53488302	Middle Cover - Microline 320	Yes	Yes	Yes	No
Cover	53488402	Middle Cover - Microline 321	Yes	Yes	Yes	No
Cover	53070701	Middle Cover - Microline 320 (with SSD)	No	No	No	Yes
Cover	53070801	Middle Cover - Microline 321 (with SSD)	No	No	No	Yes

Chassis

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Chassis	50061101	Middle Cover - Microline 320	Yes	Yes	Yes	No
Chassis	50061201	Middle Cover - Microline 321	Yes	Yes	Yes	No
Chassis	50104501	Middle Cover - Microline 320 (with SSD)	No	No	No	Yes
Chassis	50104601	Middle Cover - Microline 321 (with SSD)	No	No	No	Yes

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1.2 PRODUCT SPECIFICATIONS

1.2.01 Print Method

Impact Dot Matrix
Number of Print Wires: 9
Print Wire Diameter: .013 inch (.34 mm)

1.2.02 Print Modes

Revs A, B, and C

High Speed Draft (HSD)
Utility
Near Letter Quality (NLQ)

Rev D

Super Speed Draft (SSD)
High Speed Draft (HSD)
Utility
Near Letter Quality (NLQ)

1.2.03 Character Pitches

10 CPI
12 CPI
17.1 CPI
20 CPI
Proportional (not available in High Speed Draft mode)

1.2.04 Character Sets

Standard (Microline) Version

Standard ASCII
IBM Line Graphics
Down-Line Loadable (DLL)
Block Graphics

Epson/IBM Version

Character Set I
Character Set II
DLL (not available through Menu)

NOTES: Characters Per Inch = cpi
Characters Per Second = cps
Dots Per Inch = dpi
Character Sets are selected through the Menu

1.2.05 Print Speed

NOTE: Super Speed Draft (SSD) is available ONLY with Rev D units.

Character Pitch

Print Mode	10 cpi	12 cpi	17.1cpi	20 cpi
SSD	N/A	360 cps	N/A	N/A
HSD	300 cps	300 cps	300 cps	300 cps
Utility	250 cps	250 cps	250 cps	250 cps
NLQ	62.5 cps	62.5 cps	62.5 cps	62.5 cps

Print Speed at Different CPI for the ML 320/321

Mode	**CPI**	**CPS**	**Horiz. DPI**	**Vert DPI**	**LPS**
SSD	12	360	192		30.0
HSD	10	300	100		30.0
	12	300	120		25.0
	17.1	300	171		17.5
	20	300	200		15.0
Utility	10	250	120		25.0
	12	250	144		20.8
	17.1	250	206		14.6
	20	250	240		12.5
LQ (2 Pass Print)	10	62.5	240		6.25
	12	62.5	288		5.20
	17.1	62.5	412		3.64
	20	62.5	480		3.12

1.2.06 Print Resolution

NOTE: Super Speed Draft (SSD) is available ONLY with Rev D units.

	Character Pitch			
Print Mode	10 cpi	12 cpi	17.1cpi	20 cpi
HSD	100 dpi	120 dpi	171.4 dpi	200 dpi
Utility	120 dpi	144 dpi	205.7 dpi	240 dpi
NLQ	240 dpi	288 dpi	411.4 dpi	480 dpi

1.2.07 Character Matrix Sizes

NOTE: SSD is available ONLY with Rev. D units.

PRINT MODE	MATRIX SIZE
SSD	7 x 7
HSD	7 X 7
Utility	9 X 7
NLQ	17 X 13

1.2.08 Paper Feed Specification

Available Paper Paths

- Rear
- Top
- Bottom Feed

NOTE: Bottom Feed requires the use of the optional pull tractor

Line Feed Increments

1/6", 1/8", n/72", n/144", n/288" and n/216".

Line Feed Timing

70 ms @ 6 lines per inch
60 ms @ 8 lines per inch
Slew Rate: 4.5 inches per second (Continuous Feed Paper)

1.2.09 Interface Specifications

Centronics Parallel (Standard)
RS232C Serial (Optional)

NOTE: Interface cables are sold separately.

A shielded cable is required. Twisted-pair wires are recommended for noise protection. Parallel interface cables should be no more that 16.4 feet (5 m) in length.

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1.3 PAPER SPECIFICATIONS

1.3.01 Width

Microline 320
- Minimum: 3 inches (76.2 mm)
- Maximum: 10 inches (254 mm)

Microline 321
- Minimum: 3 inches (76.2 mm)
- Maximum: 16 inches (406.4 mm)

1.3.02 Single Part Forms

Weight
- Minimum: 12 pound (45 g/m2)
- Maximum: 24 pound (90 g/m2)

Thickness
- Maximum: 0.014 inches (0.356 mm)

1.3.03 Multipart Forms - Carbon Lined or Pressure Sensitive

Weight
- Minimum: 9 pound (35 g/m2)
- Maximum: 11 pound (40 g/m2)

Thickness
- Maximum: 0.014 inches (0.356 mm)

Number of Copies
- Original plus four copies

1.3.04 Multipart - Interleaf

Weight

Paper
- Minimum: 10 pound (38 g/m2)
- Maximum: 12 pound (45 g/m2)

Carbon
- Maximum: 9 pound (35 g/m2)

Thickness
- Maximum: 0.014 inches (0.356 mm)

Number of Copies
- Original plus four copies

1.3.05 Cut Sheets (Single Part ONLY)

Friction Feed

Weight
- Minimum: 12 pound (45 g/m2)
- Maximum: 24 pound (90 g/m2)

Thickness
- Maximum: 0.014 inches (0.356 mm)

Cut Sheet Feeder 3000

Weight
- Minimum: 12 pound (45 g/m2)

Maximum: 24 pound (90 g/m2)

Thickness

Maximum: 0.014 inches (0.356 mm)

1.3.06 Envelopes (Individual)

Weight

Maximum: 24 pound maximum (90 g/m2)

Thickness

Maximum: 0.016 inches (0.41 mm)

Dimensions

6.5 inches x 3 5/8 inches
8 7/8 inches x 3 7/8 inches
9.5 inches x 4 1/8 inches

1.3.07 Envelopes (Continuous)

NOTES: Continuous Feed Envelopes should be used ONLY with bottom feed.

Weight

Maximum: 24 pound (90 g/m2)

Thickness

Maximum: 0.014 inches (0.36 mm)

Width

Minimum: 3 inches (76.2 mm)
Maximum: 10 inches (354 mm)

1.3.08 Card Stock

NOTES: Card Stock should be used ONLY with bottom feed.
Set the head gap at Position 2 for 100 pound card stock.

Weight

Maximum: 100 pound (150 g/m2)

Thickness

Maximum: 0.008 inches (0.20 mm)

Dimensions

Maximum: 5 inches x 8 inches

1.3.09 Labels

NOTES: Labels should be used ONLY with bottom feed.
Do NOT use fabric labels.
Do NOT print on the edge or perforation of the label.

Carrier Width

Maximum: 8.5 inches (216 mm) Microline 320
Maximum: 15 inches (381 mm) Microline 321

Thickness

Maximum: 0.011 inches (0.28 mm)

1.3.10 Transparencies

Thickness

Maximum: 0.004 inches (0.10 mm)

Dimensions

Maximum: 8.5 inches wide x 11 inches long (216 mm x 260 mm)

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1.4 PHYSICAL SPECIFICATIONS

1.4.01 Printer Dimensions

The printer dimensions do not include the platen knob, acoustic cover, or paper separator

Product	Height	Width	Depth
320	4.6"	15.7"	13.6"
321	4.6"	21.7"	13.6"

1.4.02 Weight

Microline 320

Revs A, B, and C:	16 pounds
Rev D:	17.2 pounds (7.8 kg)

Microline 321

Revs A, B, and C:	20 pounds
Rev D:	22.2 pounds (10.1 kg)

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1.5 POWER REQUIREMENTS

1.5.01 Input Power Requirements

Single Phase AC
Voltage
120 VAC +5.5%, -15%
or
220/240 VAC +10%, -15%

Frequency
50/60 Hz +/- 2%

1.5.02 Power Consumption

Revs A, B, and C
Operating: 315 VA
Idle: 80 VA
Rev D
Operating: 70 VA
Idle: 25 VA

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1.6 ENVIRONMENTAL REQUIREMENTS

1.6.01 Temperature

Operating
41 through 104 degrees Fahrenheit (5 to 40 degrees Celsius)
Non-Operating
14 through 109.4 degrees Fahrenheit (-10 to 43 degrees Celsius)
Storage
-40 through 158 degrees Fahrenheit (-40 to 70 degrees Celsius)

1.6.02 Relative Humidity

Operating
20% to 90%
Non-Operating
5% to 95%
Storage
5% to 95%

1.6.03 Acoustic Specifications

Standard Operation
57 dba
Quiet Mode
52 dba

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1.7 AGENCY APPROVALS

1.7.01 Listings

Revs A, B, C, and D
- UL Standard No. 478
- CSA Standard C22.2 No. 220
- FCC Part 15, Subject J, Class B

Revs A, B, and C
- VDE 0806, VDC 0875 Class B
- BS5850

Rev D
- VDE 0806, VFG 0243 Class B
- BS7002

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1.8 OPTIONS

Pull Tractor with Acoustic Cover
Cut Sheet Feeder with Access Cover (CSF-3000A)
Super-Speed RS232-C Serial Interface Board

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1.9 CONSUMABLES

1.9.01 Cartridge Ribbon

Black

3 million character ribbon life
Re-inking cartridge

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1.10 MEMORY SPECIFICATIONS

1.10.01 DRAM
60 Kbytes

1.10.02 Working RAM
15.3 Kbytes

1.10.03 Print Buffer
3.5 Kbytes

1.10.04 Image Buffer
13.2 Kbytes

1.10.05 Receive Buffer
Epson Mode: 28 Kbytes
IBM Mode: 16 Kbytes

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1.11 RELIABILITY SPECIFICATIONS

1.11.01 Mean Time Between Failures (MTBF)
5000 hrs @ 25% duty cycle, 35% page density

1.11.02 Mean Time To Repair (MTTR)
15 minutes @ major sub-assembly level

1.11.03 Printer Life
12,000 hrs @ 25% duty cycle, 35% page density

1.11.04 Ribbon Life
3 million characters

1.11.05 Printhead Life
200 million characters in 10 cpi utility print quality. 35% page density and 25% duty cycle

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2.1 PRINTER OVERVIEW

2.1.01 General Information

This section describes the operation of the printer. It is divided into three parts.

1) Circuit Board Description ( )
The major components of the main controller board are described and functional descriptions of the operator panel board and power supply are provided. Some signal names are listed with a (-N) after them. This means that the signal is "active" or ON when it is a logic "0". This is also indicated by a line over the signal name (I-PRIME).

2) Electrical Operation ( )
This section views the printer functions from an electrical perspective.

3) Mechanical Operation ( )
This section views the printer functions from a mechanical perspective.

Serial Number Identification & (A-D) Revision Levels

A
Rev A units are original production units. An interconnect module connects the power supply board to the main control board.

B
Rev B units are retrofitted to include a modified interconnect module, which prevents corrosion.

C
Rev C units have a cable harness connection between the power supply board and the main control board. The cable harness replaces the interconnect module.

D
Rev D units have no power supply board. The circuitry for the power supply board has been incorporated on the main control board.

Please Note the following:
The Rev C main control board (LXMC) and power supply board (SUII) are downward compatible with Rev A and B units.

The Rev A and Rev B main control board (LXMC) and power supply board (PAII) cannot be used in Rev C units.

Rev D units do NOT use Rev A, Rev B, or Rev C main control boards, transformers, operator panels, upper covers, and lower covers. Rev D units have a unique main control board (LXMR), no power supply board, a 50 volt transformer, and a unique operator panel (LXON).

NOTE:
Please refer to the parts lists (Appendix B) for parts differentiation. Please be sure of the parts you need before ordering to avoid confusion and incorrect parts orders.

Printer Serial Number Identification
There are four serial number revision levels for the Microline 320 and 321 printers. Hardware differences exist between levels. To identify the revision level of a printer, record the serial number from the back of the printer. Refer to the following to decode the serial number.

Example Printer Serial Number: 401D0154693

Date Code	401 (4 = year. 01 = month)
Revision	D
Serial Number	0154693

For more information see the compatibility chart ( ).

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2.2 CIRCUIT BOARD DESCRIPTION

Operator Panel Board ( )

Power Supply ( )

Control Board ( )

Large Scale Intergrated Circuitry ( )

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2.2.01 Operator Panel Board

Rev A, B, C, and D

The operator panel board contains switches and LED's which allow the end user to control and monitor the printer's operation. **For specific information on the capabilities and use of the operator panel, please refer to Chapter 4 ( ) in the Printer Handbook.**

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2.2.02 Power Supply

Rev A, B, and C
The power supply consists of a power transformer, filter board and a DC power supply board. The AC input voltage is stepped down to 8.6 VAC, 46 VAC and 10 VAC by the power transformer. These AC voltages are converted into + 8 vdc, + 40 vdc, and + 5 vdc by the power supply board for use throughout the printer.

Power Transformer
If the transformer temperature rises above a pre-determined level, the built-in temperature fuse opens to prevent damage to components in the printer. Once this fuse opens, the transformer MUST be replaced.

Filter Board
The power switch, line fuse, and line filter are mounted on the filter board.

Power Supply Board
This board transforms AC voltages into + 5 vdc, + 8 vdc and + 40 vdc for use throughout the printer.

Rev D
The power supply consists of the power transformer, a filter board, and power supply circuitry (located on the main controller board).

The input AC voltage is stepped down to 8.6 VAC, 46 VAC, and 10 VAC by the power transformer. These AC voltages are rectified into + 8 vdc, + 5 vdc, and + 50 vdc levels by the DC power supply circuitry on the main controller board.

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2.2.03 Control Board

Microprocessor
The microprocessor is the nucleus of the control circuitry. All peripheral circuits operate under the control of the microprocessor.

For the Rev A, B, and C printers, the microprocessor is Q7 - 80C154.

For the Rev D printers, the microprocessor is Q1 - 80C154.

Program Read Only Memory (ROM)
The printer's control program and resident character fonts are stored in the Program ROM. The microprocessor operates under the control of this program.

For the Rev A, B, and C printers, the Program ROM is Q13 - 128 kilobytes.

For the Rev D printers, the Program ROM is Q4 - 64 kilobytes.

Random Access Memory (RAM)
The RAM stores the following information.

Data to be printed (Receive Buffer)

All character fonts

Q12 has a battery backup. Data is retained even after power is removed.

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Large Scale Integrated Circuitry (LSI)

For the Rev A, B, and C printers, the LSI is Q11 - MSM6990

For the Rev D printers, the LSI is Q3 - 7U042-026.

This is an external interface and motor control LSI. It performs the following functions.

External Interface Controller

Parallel Interface Control
This circuit supplies signals used by the Centronics parallel interface.

Serial Interface Control
This circuit supplies signals used by the RS 232-C serial interface.

I/O Ports
Control signals are sent in response to commands input from the microprocessor. The input port is used to read information on the printer's condition.

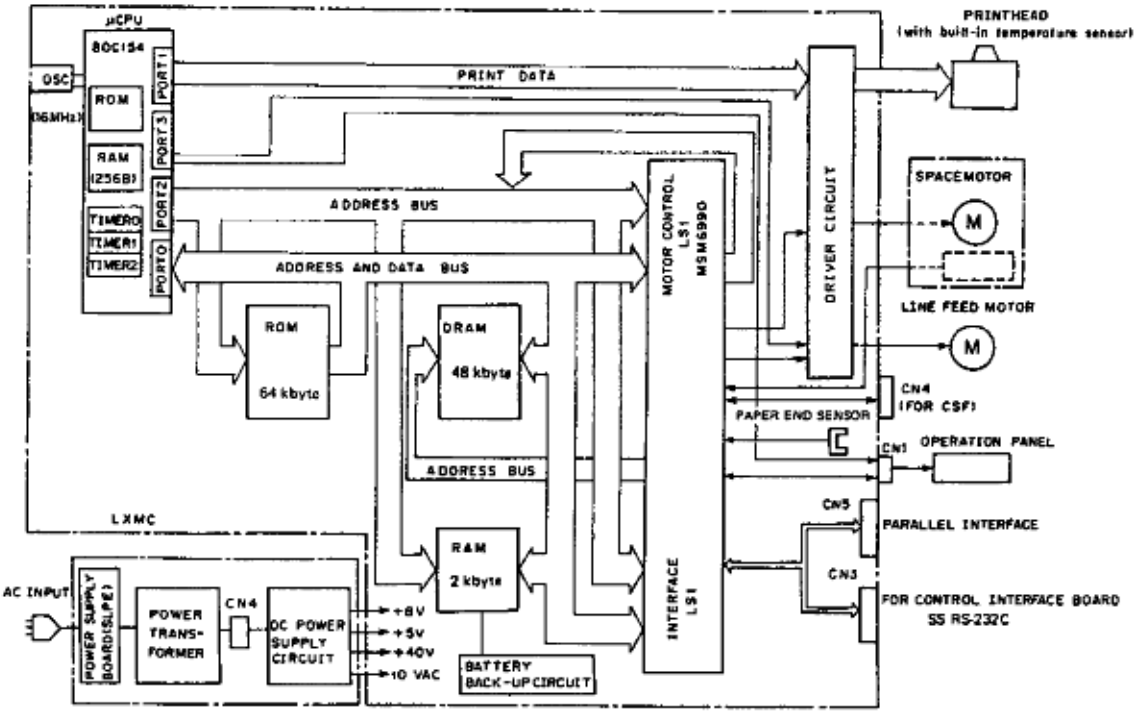
Address Latch
It latches the low order eight bits of the address bus (A0 to A7). These bits are used as addresses for read/write operations with peripheral devices.

Motor Controller

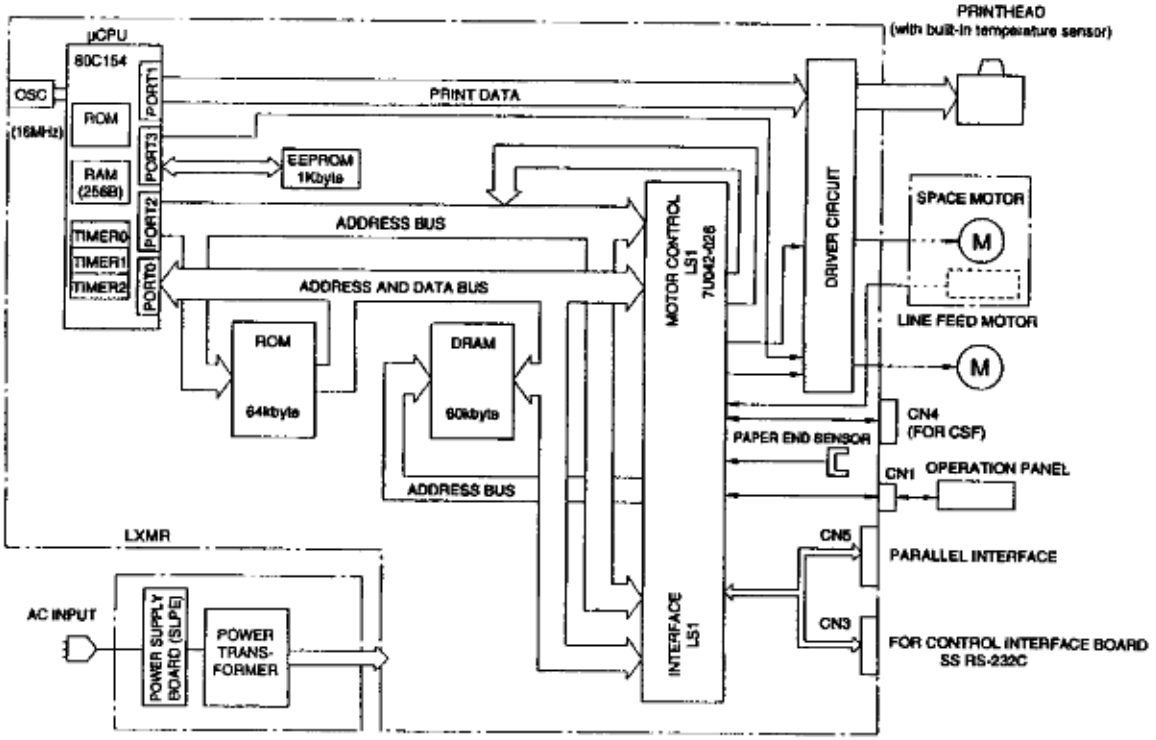
Spacing Motor Control
This function accelerates and decelerates the spacing motor in accordance with commands from the microprocessor and controls the spacing motor speed in various printing modes. Motor speed and direction are determined by monitoring the signals PHASE A and PHASE B, which are provided by the encoder on the spacing motor.

DOT Timing Generation
This function generates the DOT-ON signal (IPT), which synchronizes the print wire firing in accordance with the signals PHASE A and PHASE B. This timing information is also sent to the microprocessor.

Block Diagram (Rev A, B, and C)



Block Diagram (Rev D)



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2.3 ELECTRICAL OPERATION

2.3.01 Initialization
2.3.02 Interface Control
2.3.03 Print Head Drive Circuit
2.3.04 Spacing Operation
2.3.05 Line Feed
2.3.06 Alarm Circuit

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2.3.01 Initialization

In Rev A, B, and C printers, initialization occurs whenever the printer is powered ON or when the signal I-PRIME is received at the parallel interface.

In Rev D printers, initialization occurs whenever the printer is powered ON, or when the RSTOUT signal is sent from the reset circuit (Q11) Pin 2 to Q1 and Q3.

The initialization sequence is as follows.

In Rev A, B, and C printers, Q7 and Q11 are reset. In Rev D printers, Q1 and Q3 are reset.

In Rev A, B, and C printers, the operating modes of Q7 and Q11 are set. In Rev D printers, the operating modes of Q1 and Q3 are set.

Memory (ROM and RAM) is checked.

RAM is initialized.

Carriage homing is performed. The carriage will move to the left until it contacts the left frame.

The program then establishes the interface signals (ACK, BUSY) and the SEL lamp lights.

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2.3.02 Interface Control

Parallel Interface

In Rev A, B, and C printers, the data from the host is input through connector CN5 to the interface LSI Q11.

In Rev D printers, the data from the host is input through connector CN6 to the interface LSI Q3.

The interface LSI latches this input data in synchronization with the STB-N signal. The BUSY signal is active while this data is being processed. When processing is complete, the BUSY signal is turned OFF, and an ACK-N is sent to the host (to request more data).

The BUSY signal is also sent to the host whenever the printer is incapable of receiving data.

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2.3.03 Print Head Drive Circuit

This circuit drives the printhead coils (1 through 9) using the HD ON signal, along with the nine HD DATA signals. The pulsewidth of HD ON determines the pin drive time. The pin drive time increases as the number of pins to be driven increases. The pins are driven in synchronization with the signal IPT, which is derived from the timing encoder (PHASE A and PHASE B) on the space motor.

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2.3.04 Spacing Operation

Spacing Motor Control

The motor control LSI produces the spacing motor phase signals SP-U, SP-V, SP-W and the overdrive signal SPD-A in accordance with spacing commands from the microprocessor.

The SPD-A signal is a fixed period pulse signal whose pulsewidth is controlled by the program. This signal is used to control motor drive time.

The signal SP ON/OFF is used at acceleration/deceleration, when a large amount torque is required.

Spacing Motor Encoder Disk / Photosensor

As the spacing motor is driven, the signals PHASE-A and PHASE-B are generated by the photosensor / encoder disk (which is mounted to the spacing motor).

The motor control LSI divides the frequency of these signals in accordance with the selected print pitch. The LSI generates the IPT-N signal, which provides dot-on timing and carriage position detection.

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2.3.05 Line Feed

During a line feed operation, the line feed motor is driven by the phase signals LF03 and LF04, in synchronization with the signal LFOVD.

When it is not being driven, the line feed motor is held in place by the LF HOLD signal.

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2.3.06 Alarm Circuit

Drive Circuit Fault Alarm Circuit
This is a protective circuit which causes the AC line fuse to open when a fault occurs in the printhead drive circuit, the spacing motor drive circuit, or the line feed drive circuit. The fault alarm circuit monitors the drive time of each of these circuits and produces the ALM signal if any drive time exceeds its specified value. The ALM signal activates SCR ON, which causes the secondary coil (Rev A, B, and C: 40 volts. Rev D: 50 volts) of the transformer to short-circuit. This creates an over-current condition, which causes the AC line fuse to open.

Head Overheat Alarm Circuit
In order to protect the printhead coils, this circuit uses the printhead's built-in thermistor to monitor printhead temperature.

Printhead temperature rises when the unit is printing. When printhead temperature reaches 110 degrees Celsius, the HEAD OVERHEAT alarm is generated. Printing stops when this alarm is detected. This allows the printhead temperature to fall. When the printhead temperature falls below the alarm detection level, printing is resumed.

Here is a description of the alarm detection.

When the temperature of the printhead rises, the resistance of the thermistor decreases and the potential falls at the negative input of comparator Q6. Q6 is located on the main controller board. This inverts the comparator output, causing the HEAD TEMP signal to be sent to the motor control LSI.

Paper End Detection Circuit
When the printer runs out of paper, the photosensor on the main control board is deactivated. This causes the signal PAPER END to become low. This signal is fed to a pin of the motor control LSI. Printing stops and the ALARM lamp lights.

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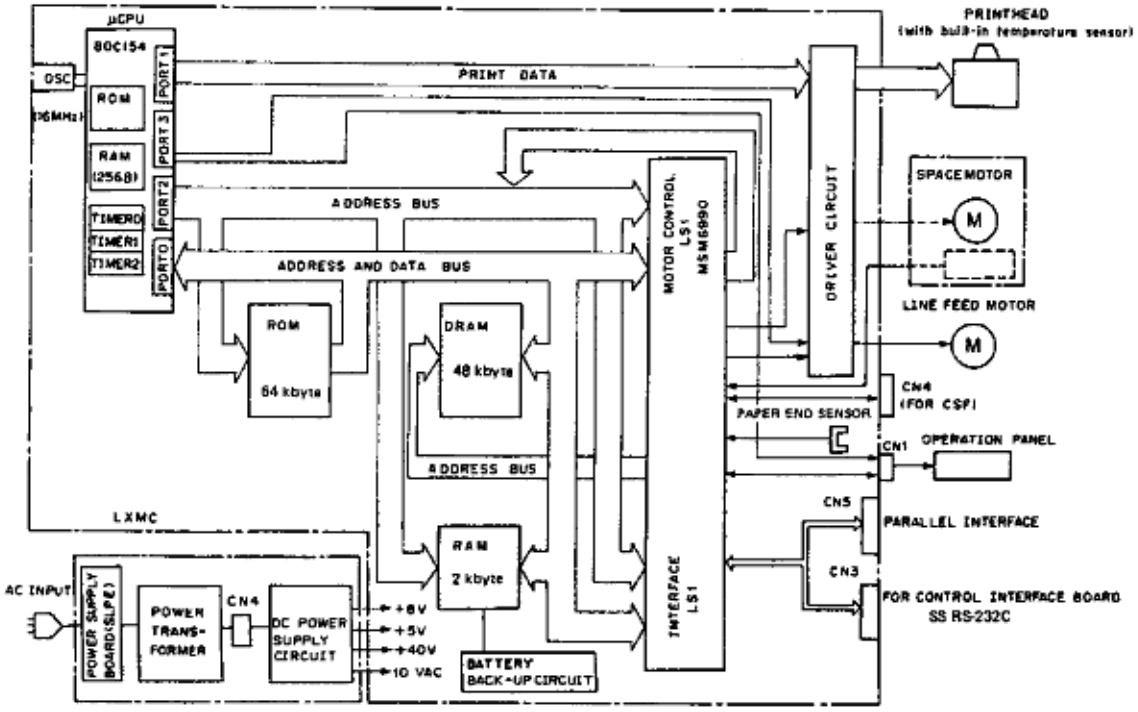
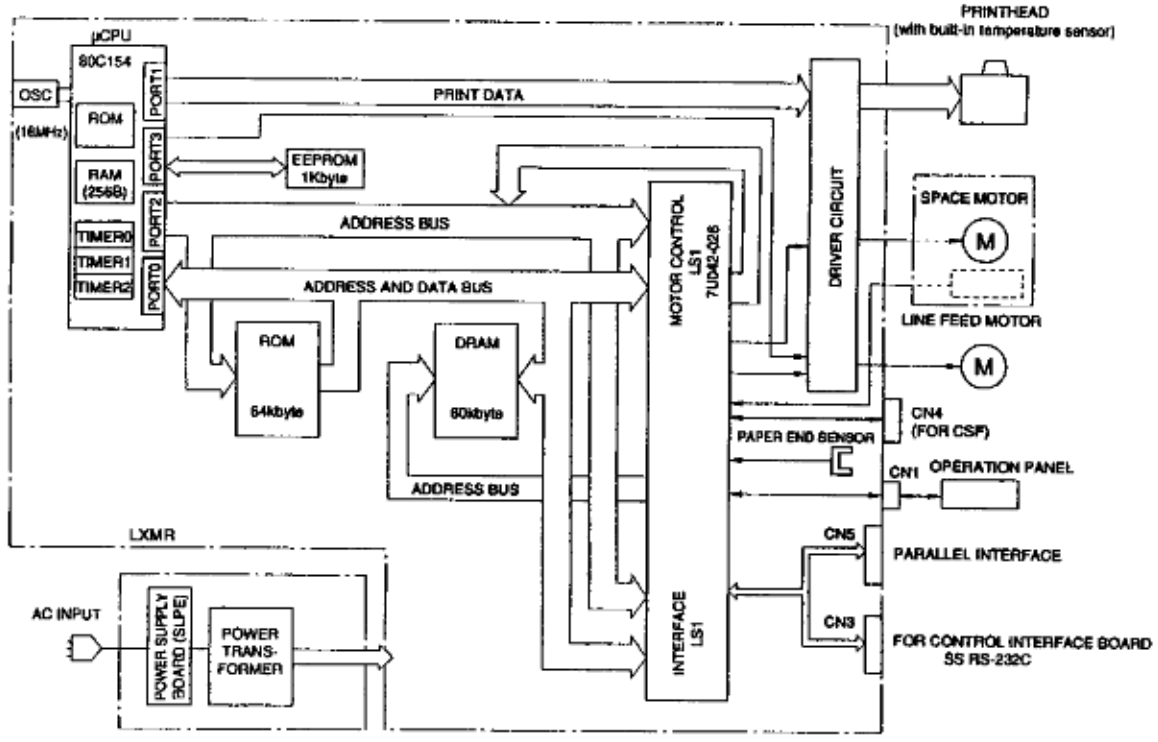
2.4 MECHANICAL PRINCIPLES OF OPERATION

Block Diagram (Rev A, B, and C)



Block Diagram (Rev D)



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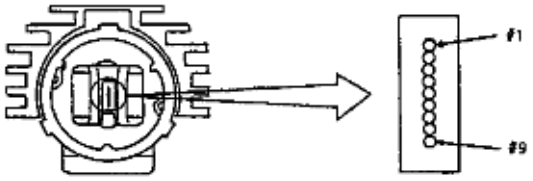
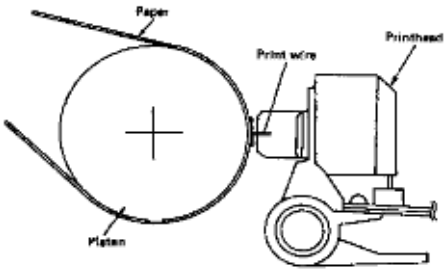
2.4.01 Printhead

The printhead used by the printer is a highly efficient, stored-energy type. Power is not consumed until the pins are activated. Printhead life is approximately 200 million characters.

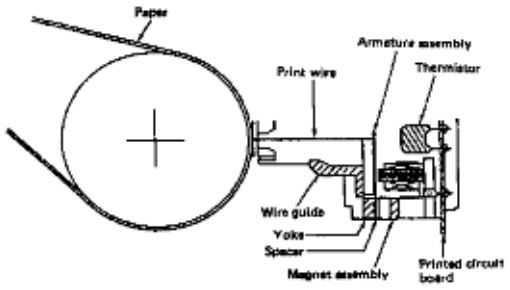


The printhead is designed with nine pins, vertically aligned. Each pin is welded to an armature ring. Behind the armature ring is a spacer ring.

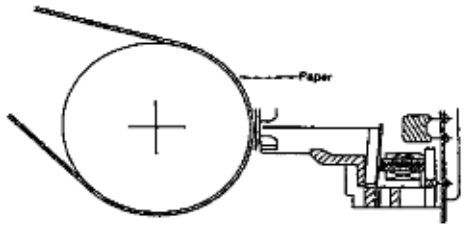


Each armature has a permanent magnet behind it. The magnet attracts the armature, keeping the pin inside the printhead. Because of the spacer ring behind the armature ring, the armature is attracted toward the permanent magnet at an angle. A coil is wrapped around each permanent magnet.

(1) When printing



(2) When not printing



When a dot is printed, current passes through the coil, creating a magnetic field which counters the magnetic field of the permanent magnet. The armature and pin spring forward. A dot is printed on the paper.

When current is removed from the coil, the magnetic field of the permanent magnet attracts the armature. The pin is retracted into the printhead.

The printhead contains a built-in thermistor (rated at 110 degrees Celsius). The thermistor monitors the printhead temperature. If the temperature exceeds the 110 degrees Celsius, the thermistor causes a signal to be generated on the main controller board. The printer stops printing. A BUSY signal is sent to the host computer. Data remains in the print buffer as long as power is supplied to the printer. When the printhead temperature drops below the 110 degree Celsius threshold, the BUSY signal to the host computer becomes inactive. Printing is resumed.

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2.4.02 Space Mechanism / Operation

The spacing operation is performed by applying power to the DC spacing motor. This drives the carriage frame along the carriage shaft, space rack, and guide rail. The carriage shaft, space rack, and guide rail are parallel to the platen.

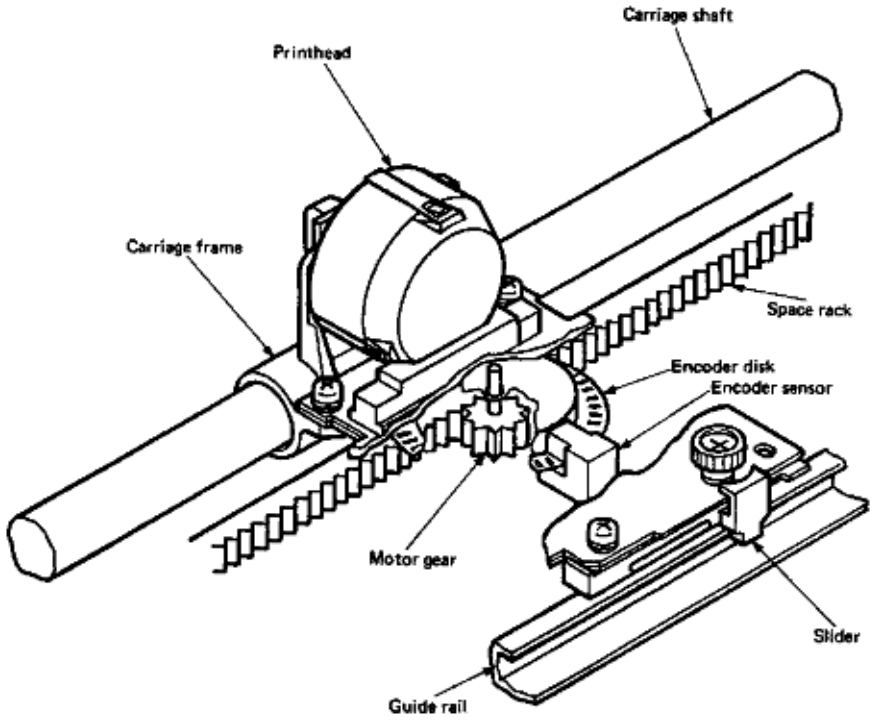
The spacing motor assembly consists of the following items.

DC Motor / Gear
Carriage Frame
Carriage Shaft
Space Rack
Encoder Disk Sensor
Encoder Disk
Guide Rail

Spacing Operation

The printhead and spacing motor are mounted on the carriage frame. The carriage frame moves along the carriage shaft, space rack, and guide rail. The carriage shaft, space rack, and guide rail are parallel to the platen. As the spacing motor rotates counterclockwise, the carriage frame is driven to the right.

When the spacing motor rotates one turn, the carriage frame moves 0.8 inch (20.32 mm).



Motor rotation turns the encoder disk. The timing windows on the disk then pass through the encoder disk sensor. The position of the carriage frame is obtained by counting the pulses generated by the encoder disk sensor as the disk turns.

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Head Gap Adjusting Mechanism

The head gap adjusting mechanism adjusts the gap between the platen and printhead by changing the tilt angle of the carriage frame. This is accomplished by using the adjusting lever.

Moving the adjusting lever rotates the adjusting screw. The adjusting screw is interlocked with the lever via a gear. Rotating the adjusting screw changes the angle of tilt for the carriage frame. The printhead is mounted vertically on the carriage frame. Changing the angle of tilt for the carriage frame moves the printhead closer to, or farther away from, the platen.

The adjusting cam is used to compensate for differences in the printhead gap when measured at the left and right sides of the platen. Rotating the adjusting cam changes the height of the guide rail. The height of the guide rail helps determine the distance between the printhead and platen, when measured at the right end of the platen.

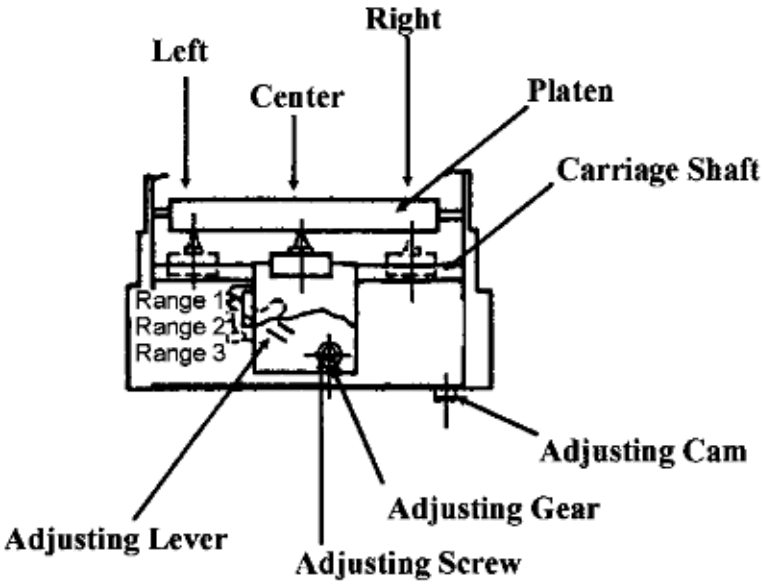
> Turning the adjusting cam to the RIGHT will lower the right side of the guide rail. This causes the printhead gap (on the right side of the platen) to increase.
>
> Turning the adjusting cam to the LEFT will raise the right side of the guide rail. This causes the printhead gap (on the right side of the platen) to decrease.

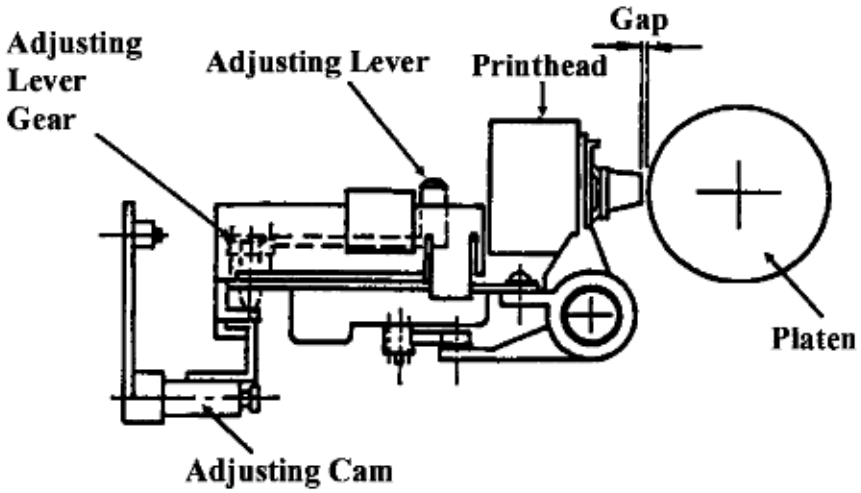
The adjusting lever determines the head gap setting.

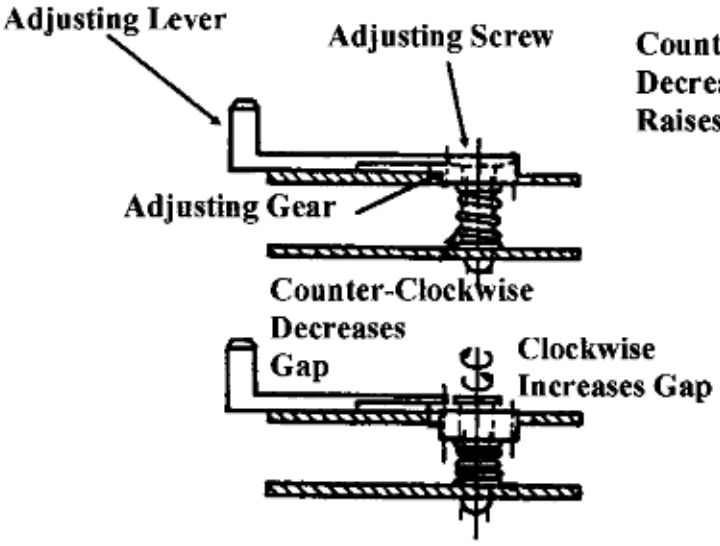
> Setting 1 is for one or two part forms.
>
> Setting 2 is for three or four part forms.
>
> Setting 3 is for envelopes and extra-thick paper.

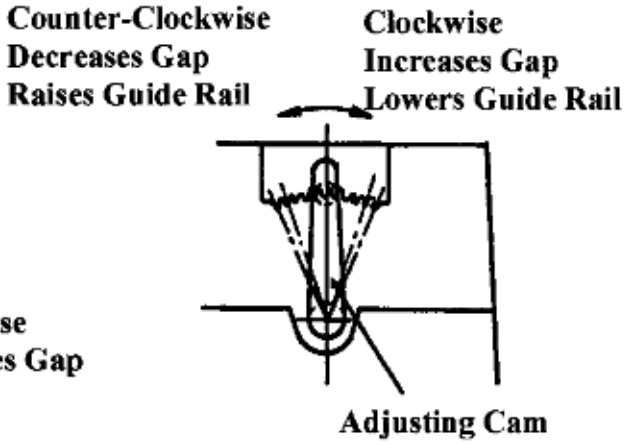
When the adjusting lever is set to position 3, the distance between the printhead and platen increases. The electrical contact (attached to the carriage cover) touches a contact pad on the spacing motor circuit board. This reduces printing speed. Slower speeds ensure adequate printing pressure.

Refer to Section 3.3 ( ) for further details on the Printhead Gap Adjustment.


Right
Left
Center
Platen
Carriage Shaft
Range 1
Range 2
Range 3
Adjusting Cam
Adjusting Gear
Adjusting Lever
Adjusting Screw


Gap
Adjusting
Lever
Gear
Adjusting Lever
Printhead
Platen
Adjusting Cam


Adjusting Lever
Adjusting Screw
Adjusting Gear
Counter-Clockwise
Decreases
Gap
Clockwise
Increases Gap


Counter-Clockwise
Decreases Gap
Raises Guide Rail
Clockwise
Increases Gap
Lowers Guide Rail
Adjusting Cam

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2.4.03 Ribbon Drive Mechanism / Operation

NOTE: The ribbon drive gear assembly is secured to the top of the spacing motor assembly by the four claw tabs.

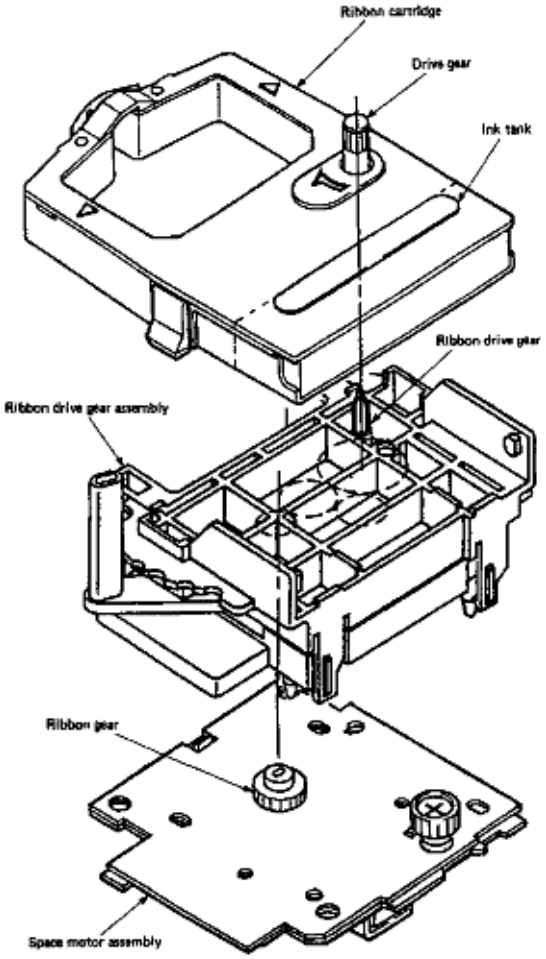
The ribbon drive mechanism drives the ribbon in sync with the spacing operation. The mechanism is driven by the spacing motor.

The ribbon drive mechanism consists of the following items.

Ribbon Drive Gear Assembly
Ribbon Gear (The gear is attached to the spacing motor).
Ribbon Cartridge

Ribbon Cartridge

A uni-directional feed, continuous ribbon is used. The ribbon is replenished by a built-in ink tank in the ribbon cartridge.



Ribbon Feed Operation
As the spacing motor rotates, the ribbon gear (on the spacing motor shaft) turns the drive gear in the ribbon cartridge via the ribbon drive gear assembly. As a result, the ribbon is moved.

In bi-directional printing, the ribbon gear rotational direction reverses each time the direction of the carriage movement reverses. In this case, the gears in the ribbon drive gear assembly move the position of an intermediate idler gear, causing the ribbon to feed in one direction.

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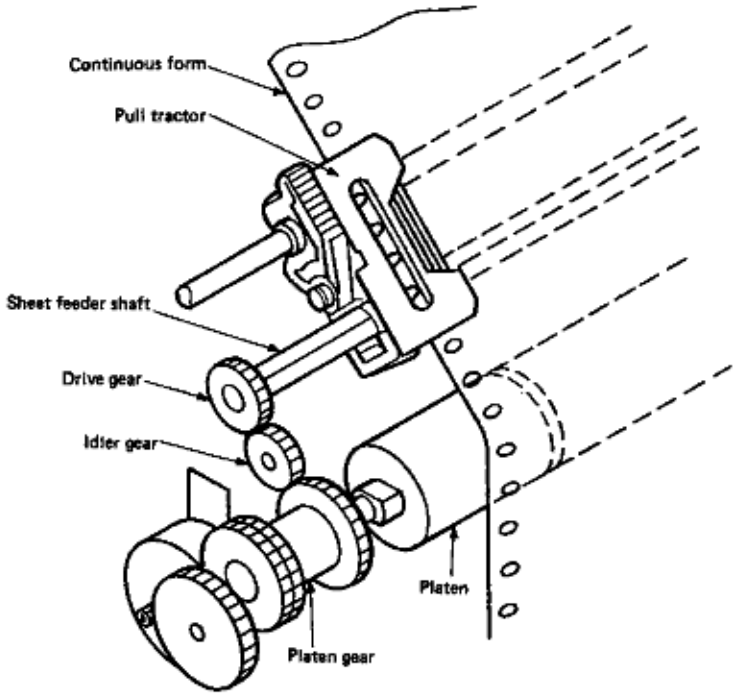
2.4.04 Paper Feed Mechanism

The paper feed mechanism consists of the following items.

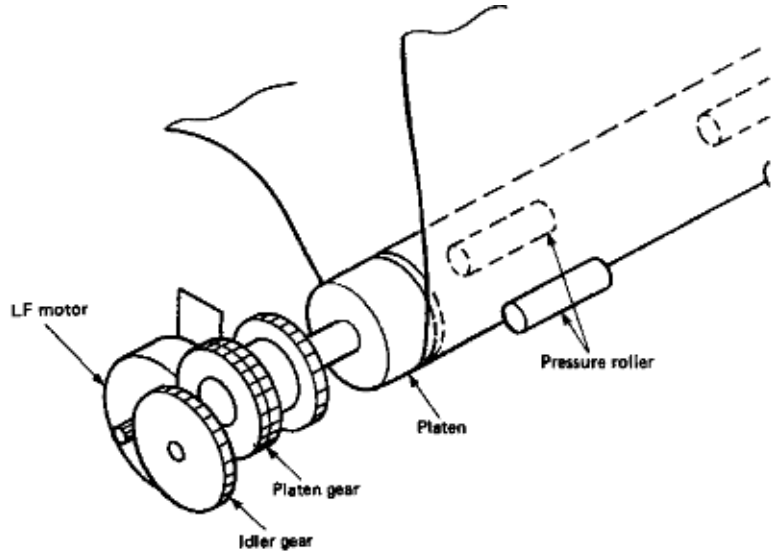
Stepper Motor (with drive gear)
Reduction Gear
Platen
Push Tractor Unit
Pressure Rollers (friction feed rollers)
Pull Tractor Unit (optional)

Paper Feed Operation
The line feed motor is mounted on the left side frame of the printer. It drives the platen via the reduction gear. If the optional tractor unit is installed, platen rotation is transmitted through the idle gear to the tractor unit.



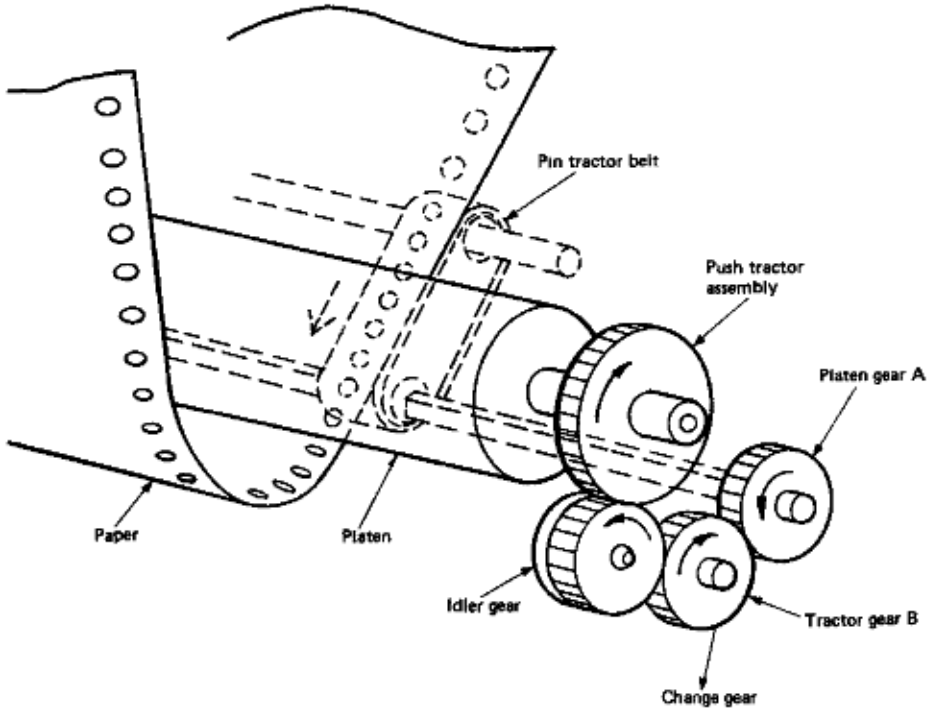
The paper feed mechanism is designed so when the stepper motor rotates 48 steps (360 degrees), paper is fed 0.17 inch (4.23 mm).

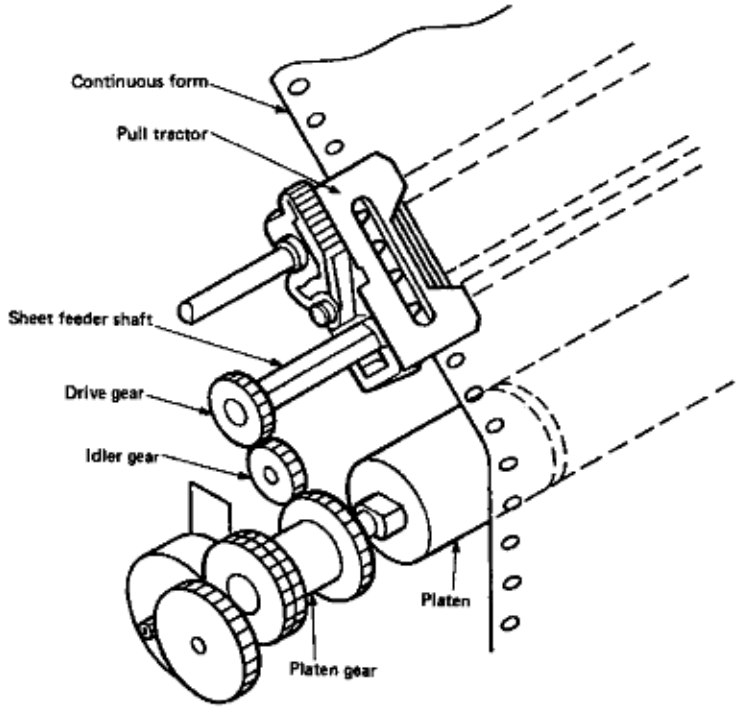
Friction Feed
When the release lever is set to the friction feed position, the release lever disengages the change gear from the tractor gear. At the same time, the release lever applies pressure to push the pressure rollers against the platen, allowing paper to be fed.



Tractor Feed

When the release lever is set to the tractor feed position, the release lever allows the reset spring to push the change gear toward the tractor gear. At the same time, the release lever pushes the pressure rollers away from the platen, which allows paper to be fed by the push tractor.





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2.4.05 Paper-End Detection Mechanism

Rear Paper Feed
When paper is installed in the printer, it prevents the paper-end lever (Tip A) from falling into the groove of the paper chute and platen. This activates the paper-end sensor.

When the printer runs out of paper, the paper-end lever falls into the groove of the paper chute. The rear part of the paper-end lever deactivates the paper-end sensor. An out-of-paper condition is detected.

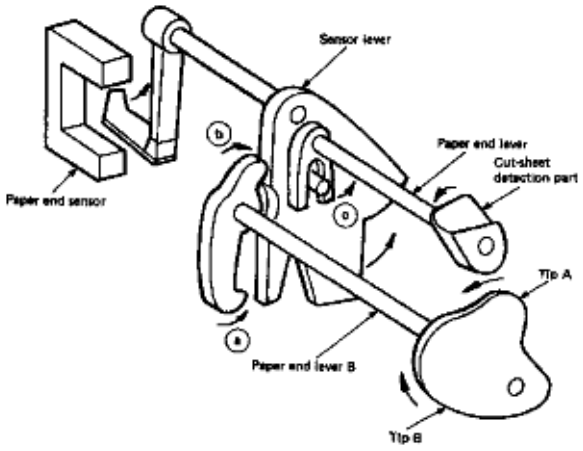
Paper-end is detected when the end of the remaining paper is about 1 inch (25.4 mm) from the printhead position.

Bottom Paper Feed
Paper installed in the printer contacts the paper-end lever (Tip B). The paper prevents the bottom paper-end lever from falling into the slot in the bottom paper guide. This causes the rear part of the paper-end lever to activate the paper-end sensor.

When the printer runs out of paper, the tip of the bottom paper-end lever falls into the hole in the bottom paper guide. The rear part of the paper-end lever activates the paper-end sensor. An out-of-paper condition is detected.

Paper-end is detected when the end of the remaining paper is about 1 inch (25.4 mm) from the printhead position.

Cut-Sheet Paper Feed
Paper installed in the printer prevents the paper-end lever (Tip C) from falling into the groove of the paper chute. The paper-end sensor is activated.



When paper is removed, the paper-end lever falls into the groove of the paper chute. The rear part of the paper-end lever deactivates the paper-end sensor. An out-of-paper condition is detected.

Paper-end is detected when the end of the remaining paper is about 1 inch (25.4 mm) from the

printhead position.

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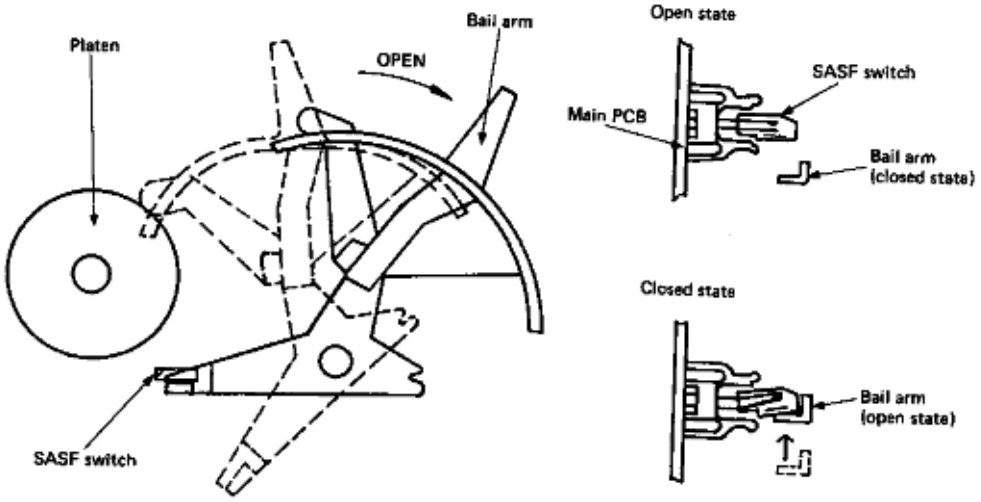
2.4.06 Semi-Automatic Sheet Feeder (SASF) Operation

When the paper release lever is set for friction feed paper, opening the bail arm causes the SASF switch to close. The line feed motor feeds two inches of paper. SASF motion stops after two inches of paper feed motion and paper-end is detected.

SASF should be used for loading tractor feed paper. Okidata recommends using SASF instead of pressing FORM FEED. Since the paper bail is opened for SASF, there is less chance of jamming.



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OKIDATA

Service Guide ML320/ML321

Chapter 3 Maintenance & Disassembly

Maintenance & Disassembly

This chapter consists of the following sections:

Disassembly / Assembly Procedures ( )

Adjustments ( )

Cleaning ( )

Lubrication ( )

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3.1.01 General Information

This section lists the parts replacement, adjustment, cleaning, and lubrication procedures.

Disassembly should not be performed unless absolutely necessary. NEVER perform disassembly on a malfunctioning unit until you have followed the **failure analysis procedures ( ) in Section Four of this Service Handbook.**

Follow the procedures listed in Adjustments and Service Settings. Adjustments may be required when either consumables or parts are replaced. Failure to perform these procedures could result in unnecessary service calls.

Cleaning procedures must be performed correctly if high print quality is to be achieved.

3.1.02 Maintenance Tools

The following tools are required to service the unit.

#2 Phillips Screwdriver (with magnetic tip)
Straight-slot Screwdriver
Needle Nose Pliers (4 Inch)
Rubber Band (used during removal of upper cover)
Cutters
Feeler Gauge (capable of measuring .002, .016, and .018 inches)
Large, straightened Paper Clip (used during printhead gap adjustment)
Digital Multimeter
Shop Vacuum
Cloth (soft and lint-free)
Cotton Swabs
All-purpose Cleaner
Platen Cleaner
Contact Kleen (P/N 51802301)
Grease (Dow Corning BR2 or equivalent)
Machine Oil

3.1.03 Maintenance Precautions

- Do NOT disassemble the unit if it is operating normally.
- Before starting disassembly and assembly, always power OFF the unit and detach the power cord.
- Detach the interface cable, if installed.
- Do not remove parts unnecessarily. Try to keep disassembly to a minimum.
- Use the recommended maintenance tools.

- When disassembling, follow the listed sequence. Failure to follow the correct sequence may result in damaged parts.

- Since screws, collars and other small parts are easily lost, they should be temporarily attached to the original positions.

- When handling circuit boards use extreme care. Integrated circuits (microprocessors, ROM, and RAM) can be destroyed by static electricity.

- Do not place printed circuit boards directly on conductive surfaces.

- Follow the recommended procedures when replacing assemblies and units.

- Perform the Printhead Gap Adjustment **(Refer to Section 3.3)** when the following occur.

- Print quality is darker on either side of the document.

- The following parts are replaced.

- Space Motor Assembly **(Refer to Section 3.2.15 ()**

- Carriage Shaft **(Refer to Section 3.2.16 ()**

- Guide Rail **(Refer to Section 3.2.18 ()**

- Platen Assembly **(Refer to Section 3.2.19 ()**

Serial Number Identification & (A-D) Revision Levels

A
Rev A units are original production units. An interconnect module connects the power supply board to the main control board.

B
Rev B units are retrofitted to include a modified interconnect module, which prevents corrosion.

C
Rev C units have a cable harness connection between the power supply board and the main control board. The cable harness replaces the interconnect module.

D
Rev D units have no power supply board. The circuitry for the power supply board has been incorporated on the main control board.

Please Note the following:
The Rev C main control board (LXMC) and power supply board (SUII) are downward compatible with Rev A and B units.

The Rev A and Rev B main control board (LXMC) and power supply board (PAII) cannot be used in Rev C units.

Rev D units do NOT use Rev A, Rev B, or Rev C main control boards, transformers, operator panels, upper covers, and lower covers. Rev D units have a unique main control board (LXMR), no power supply board, a 50 volt transformer, and a unique operator panel (LXON).

NOTE:
Please refer to the parts lists (Appendix B) for parts differentiation. Please be sure of the parts you need before ordering to avoid confusion and incorrect parts orders.

Printer Serial Number Identification
There are four serial number revision levels for the Microline 320 and 321 printers. Hardware differences exist between levels. To identify the revision level of a printer, record the serial number from the back of the printer. Refer to the following to decode the serial number.

Example Printer Serial Number: 401D0154693

Date Code	401 (4 = year. 01 = month)
Revision	D
Serial Number	0154693

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
LXMC Board	55041411	Main Control Board	Yes	Yes	No	No
LXMC-3 Board	55041412	Main Control Board	Yes	Yes	Yes	No
LXMR	55075111	Main Control Board (with SSD)	No	No	No	Yes

Power Supply Board

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
PAII-2 Board	55039902	Power Supply Board	Yes	Yes	No	No
SUII-2 Board	55047402	Power Supply Board	Yes	Yes	Yes	No
N/A	N/A	Power supply function included on the Main Control Board	No	No	No	Yes

Operator Panel Assembly

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
LXSP-2	55038602	Operator Panel Board	Yes	Yes	Yes	No

LXON	55075011	Operator Panel Board (with SSD)	No	No	No	Yes
N/A	50069603	Operator Panel Bezel	Yes	Yes	Yes	No
N/A	50107426	Operator Panel Bezel (with SSD)	No	No	No	Yes

Transformer

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
120 Volt XFRMR	56407503	Transformer - Microline 320	Yes	Yes	Yes	No
120 Volt XFRMR	56407502	Transformer - Microline 321	Yes	Yes	Yes	No
120 Volt XFRMR	56413201	Transformer - Microline 320 (with SSD)	No	No	No	Yes
120 Volt XFRMR	56413202	Transformer - Microline 321 (with SSD)	No	No	No	Yes

Interconnect Module

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Interconnect Module	55328301	Connects power supply board to main board	Yes	Yes	No	No

Cable

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cable	56616802	Connects power supply board to main board	No	No	Yes	No

Cable Guide

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cable Guide	51003801	Holds cable in place	No	No	Yes	Yes

Covers

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cover	53488302	Middle Cover - Microline 320	Yes	Yes	Yes	No
Cover	53488402	Middle Cover - Microline 321	Yes	Yes	Yes	No
Cover	53070701	Middle Cover - Microline 320 (with SSD)	No	No	No	Yes
Cover	53070801	Middle Cover - Microline 321 (with SSD)	No	No	No	Yes

Chassis

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Chassis	50061101	Middle Cover - Microline 320	Yes	Yes	Yes	No
Chassis	50061201	Middle Cover - Microline 321	Yes	Yes	Yes	No
Chassis	50104501	Middle Cover - Microline 320 (with SSD)	No	No	No	Yes
Chassis	50104601	Middle Cover - Microline 321 (with SSD)	No	No	No	Yes

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3.2 DISASSEMBLY/ASSEMBLY PROCEDURES

General Information

This section contains the printer disassembly procedures. Only the removal procedures are explained. Reverse the procedure for the installation.

At the bottom of each procedure is a listing of the parts covered in that procedure. The Okidata part number, item description, applicable product, comment (RSPL, Option, Consumable), serial number revision level, and the cross-reference(s) to Appendix B are provided for each part. Items included in the Recommended Spare Parts List are indicated by the acronym RSPL. N/A appears where a part number is not available.

Part Number	Item Description	Product	Comment	Revision	App. B Reference

This Service Handbook lists the disassembly procedures for major components of the unit. Okidata does NOT recommend disassembling a unit which is operating normally. If you decide to perform disassembly during this training, Okidata recommends that you perform only the disassembly procedures for RSPL items. All other procedures are provided to assist you in identifying parts. It is not likely that you will perform these procedures while servicing the product.

Be sure to read all notes, cautions, and warnings, as they contain important information regarding assembly/disassembly.

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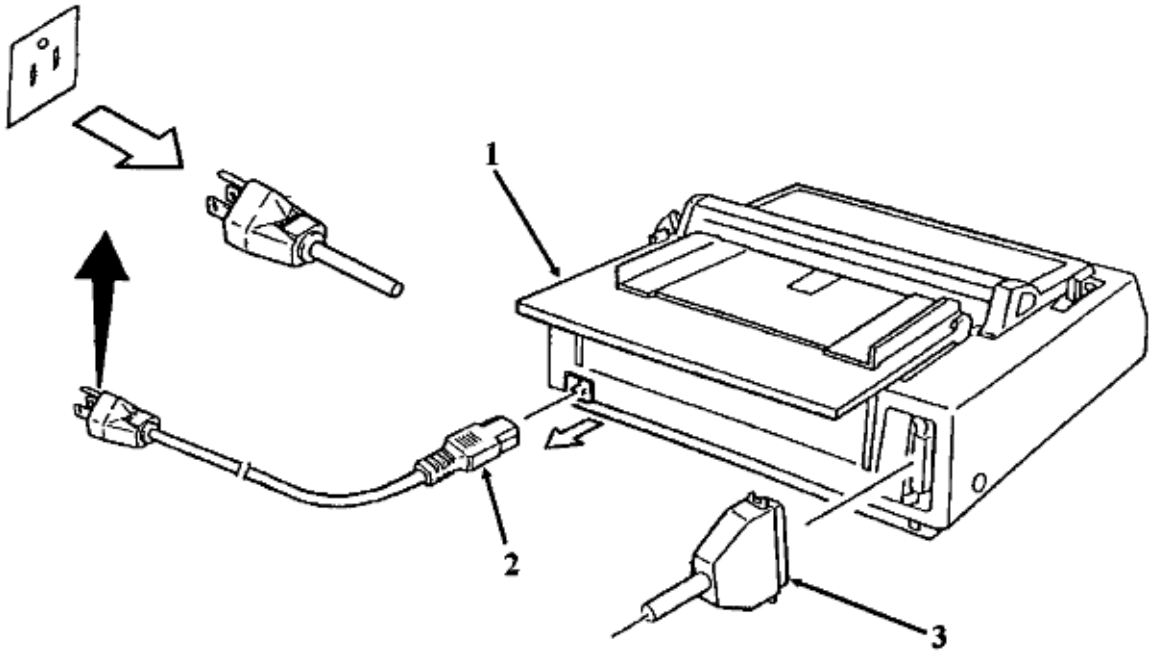
3.2.01 Preliminary Items

1) Press the AC switch (1 shows location) and power OFF the printer.

2) Remove the paper, if installed.

3) Detach the AC power cord (2).

4) Detach the interface cable (3), if installed.



Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 56609701	Cord: AC 120 V	Both	RSPL	A B C D	B.2.03 04 05
P/N 56624101	Cord: AC (220 V) (Right Angle for ML Series)	Both	Option RSPL	A B C D	B.2.03 04 05
P/N 56616501	Cord: AC 240V	Both	Option	A B C D	B.2.03 04

P/N 56624401	Cord: AC 240V	Both	Option	A B C D	B.2.05
P/N 70000803	Kit: Parallel Interface Plug'n'Play Accessory	Both	Option	A B C D	N/A

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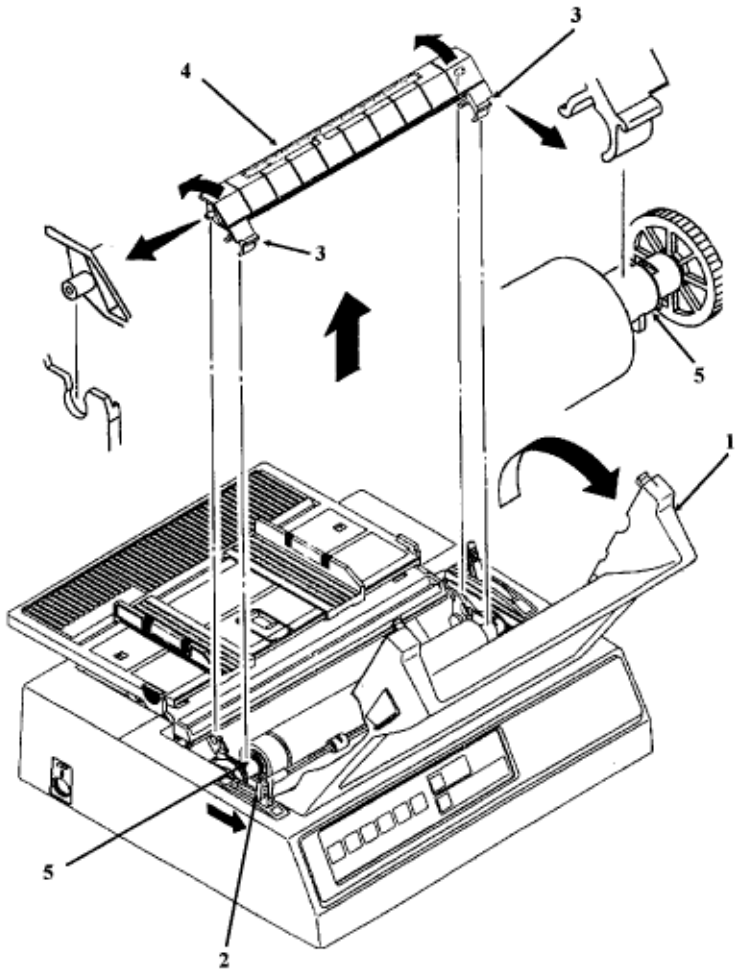
3.2.02 Separator Assembly

CAUTION: To avoid damaging the ribbon protector, slide the printhead towards the center of the printer before removing the separator assembly.

Perform these procedures first:
- 3.2.01 ( )

- Open the access cover (1).
- Move the paper bail lever (2) toward the front of the printer.
- While pressing the release latches (3), tilt the separator assembly (4) toward the rear of the printer to release it from the platen shaft (5).
- Remove the separator assembly.



Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50069801	Separator: Assembly (Narrow)	320	RSPL	A B C D	B.2.06 08 10
P/N 50069901	Separator: Assembly (Wide)	321	RSPL	A B C D	B.2.06 08 10

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3.2.03 Printhead Assembly

WARNING: The printhead will be hot immediately after printing.
Allow the printhead to cool before handling.

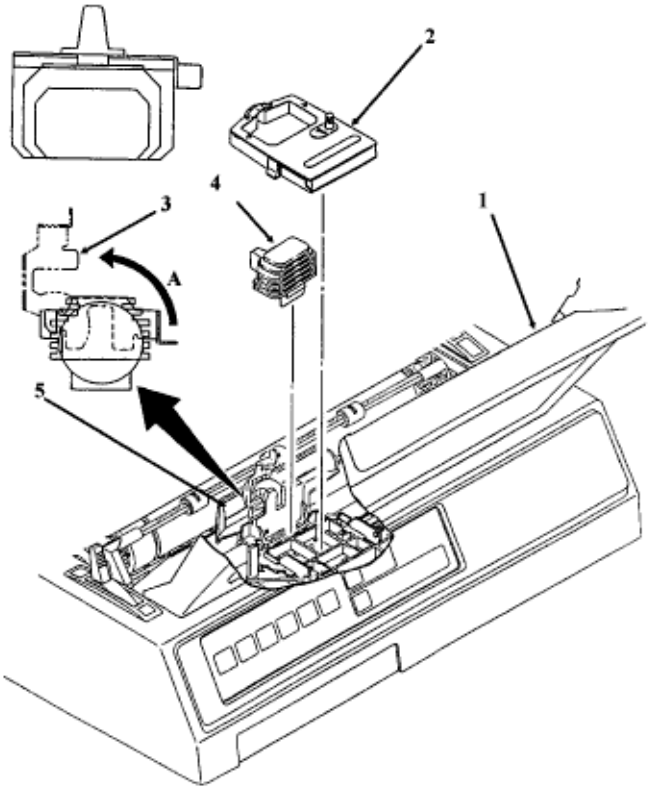
Perform these procedures first:
- 3.2.01 ( )

- Open the access cover (1).

- Remove the ribbon cartridge (2).

- Move the printhead mounting clamp (3) in the direction of arrow A to unlock the printhead (4).

- Lift and remove the printhead from the carriage frame (5).



NOTE: When installing the printhead, push the printhead towards the platen.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50063802	Printhead: (Assembly)	Both	RSPL	A B C D	B.2.03 04 05
P/N 52102001	Ribbon	Both	Consumable	A B C D	B.2.16

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3.2.04 Upper Cover Assembly

Perform these procedures first:
- 3.2.01 ( )

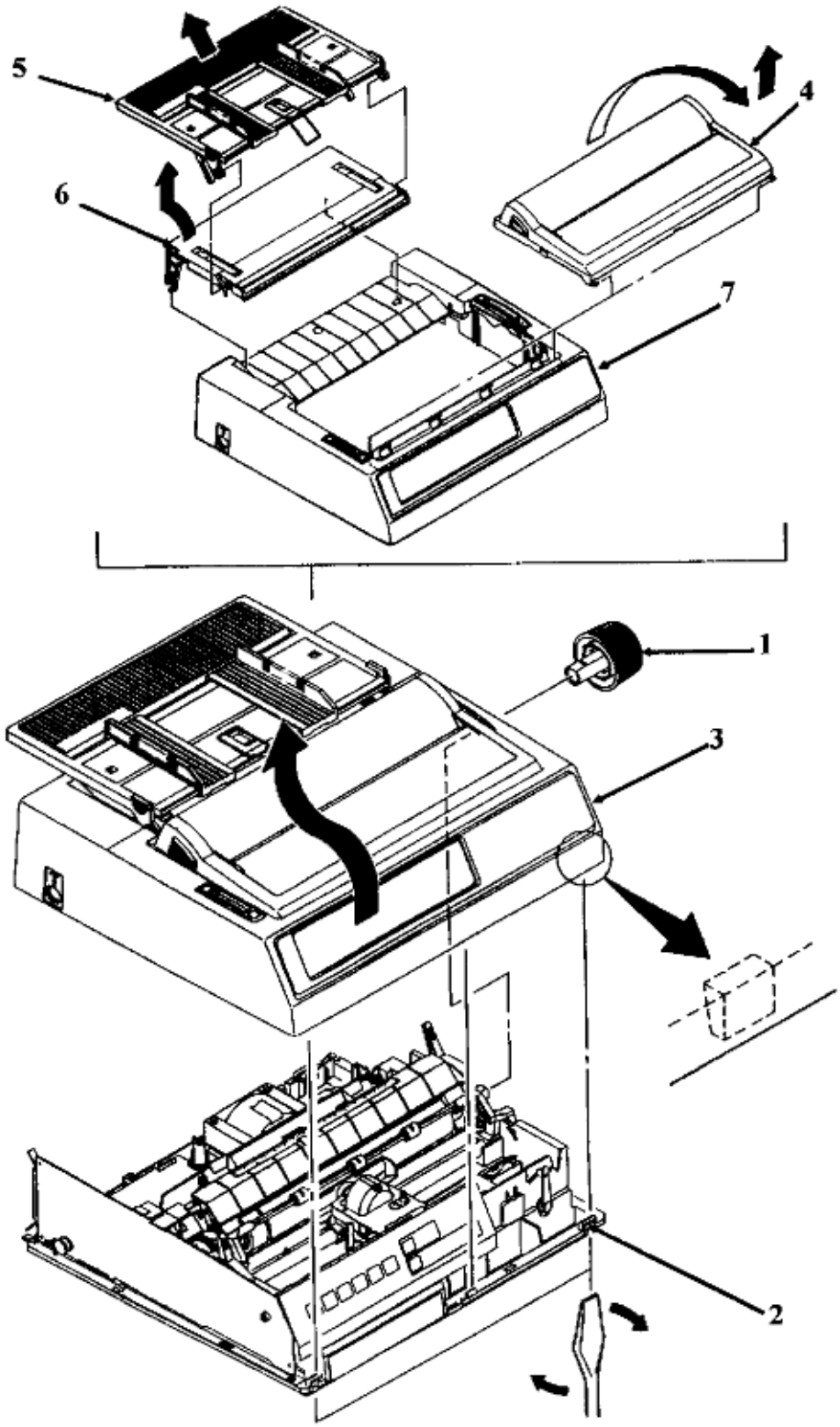
- Wrap a rubber band around the wire extensions of the interface connector.
  This pulls the extensions in and avoids damage when the cover is removed. (Notshown).

- Detach the platen knob (1).

- Insert a flat-blade screwdriver through the slots (2) and disengage the claws of the cover.
  The Microline 320 has three slots. The Microline 321 has five slots.

- Lift the front of the upper cover assembly (3) and remove the assembly.

- The upper cover assembly contains the access cover assembly (4), the sheet separator assembly (5), the rear cover (6), and the middle cover (7)



CAUTION: Do NOT rotate the access cover past the vertical when removing it. The tab extensions can break.

The Rev D middle cover is NOT compatible with the Rev A, B, and C middle cover.

Before installing the cover, move the bail arm lever towards the back of the printer and move the release lever towards the front of the printer.

After installation, verify that the cover is correctly seated in the front slots. The cover will warp if it is incorrectly installed. Check that the paper bail moves properly.

When cleaning, refer to Section 3.4( ) of this Service Handbook.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 51901101	Knob: Platen	Both	RSPL	A B C D	B.2.03 04 05
P/N 50060701	Cover: Access (Assembly)	320	RSPL	A B C D	B.2.01 02
P/N 50060801	Cover: Access (Assembly)	321	RSPL	A B C D	B.2.01 02
P/N 50060901	Separator: Sheet (Assembly)	320	RSPL	A B C D	B.2.01 02
P/N 50061001	Separator: Sheet (Assembly)	321	RSPL	A B C D	B.2.01 02
P/N 53488501	Frame: Rear Cover	320	RSPL	A B C D	B.2.01 02
P/N 53488601	Frame: Rear Cover	321	RSPL	A B C D	B.2.01 02
P/N 53488302	Cover: Middle	320	RSPL	A B C	B.2.01
P/N 53488402	Cover: Middle	321	RSPL	A B C	B.2.01
P/N 53070801	Cover: Middle (SSD)	321	RSPL	D	B.2.02
P/N 53070701	Cover: Middle (SSD)	320	RSPL	D	B.2.02

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3.2.05 Operator Panel Assembly

NOTE: The operator panel assembly and board for the Rev D units are NOT compatible with the Rev A, B, and C operator panel assembly and board.

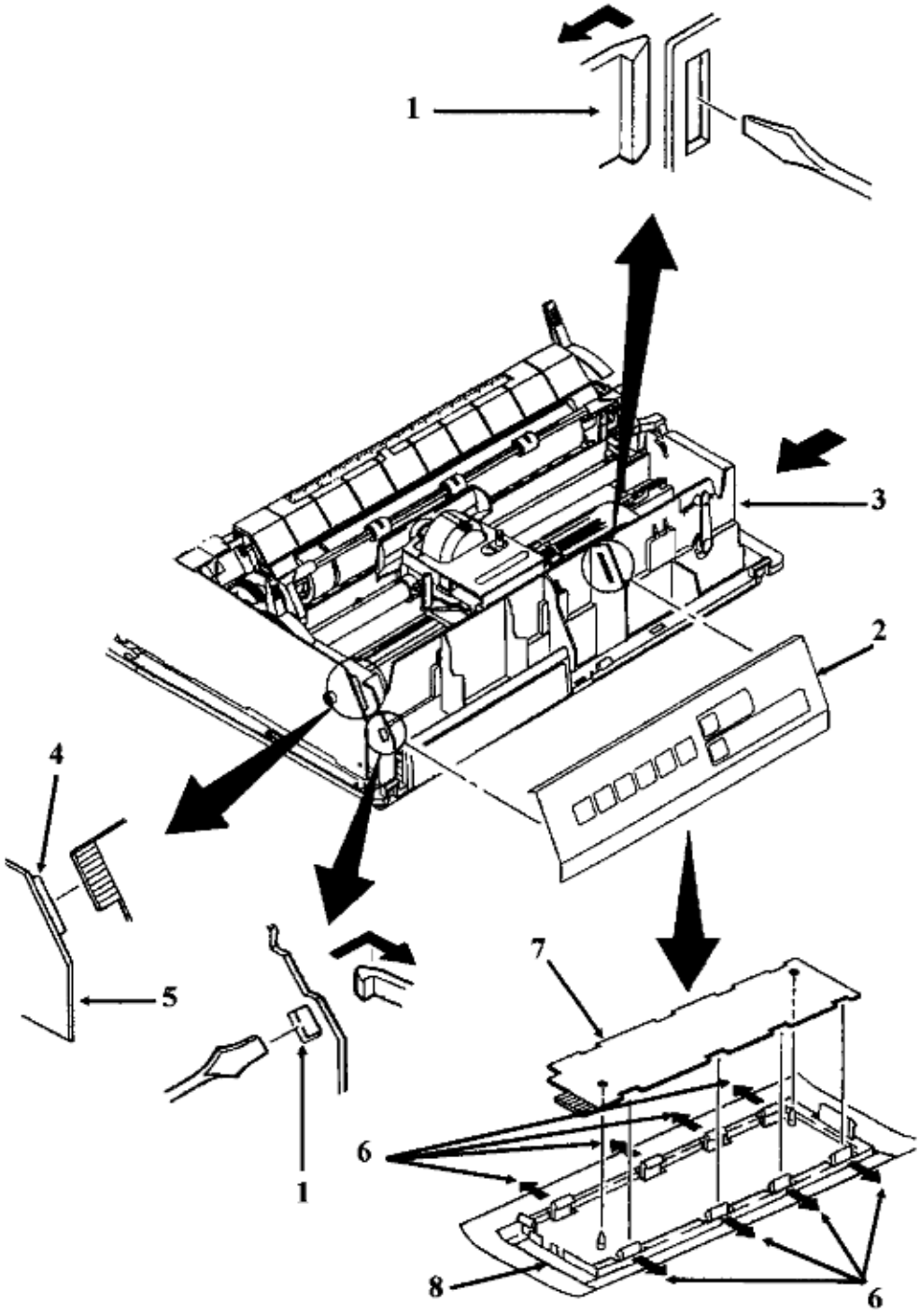
Perform these procedures first:

- 3.2.01 ( )

- 3.2.04 ( )

- Release the claws (1) and remove the operator panel assembly (2) from the chassis (3). As the operator panel assembly is removed, it must be detached from the connector (4) on the control board (5).

- Release the eight claws (6) and remove the operator board (7) from the bezel (8).



Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50069603	Panel: Operation w/Frame	Both	RSPL	A B C	B.2.12 (Assembly)

P/N 53490101	Operation Panel	Both		A B C	B.2.12
P/N 55038602	PCB: LXSP-2	Both	RSPL	A B C	B.2.12 (Operator PCB)
P/N 55075011	PCB: LXON (Assembly)	Both	RSPL	D	B.2.12 SSD Op Panel PCB

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3.2.06 Control Board

Rev A and B

CAUTION: Check the contacts between the power interconnect module, the control board, and the power supply board (Rev A and B units ONLY). Clean the contacts if dirty. If contacts are bent or broken, replace the module. Proper inspection and cleaning of the power interconnect module contacts can eliminate a false diagnosis of a failed control board or power supply board.

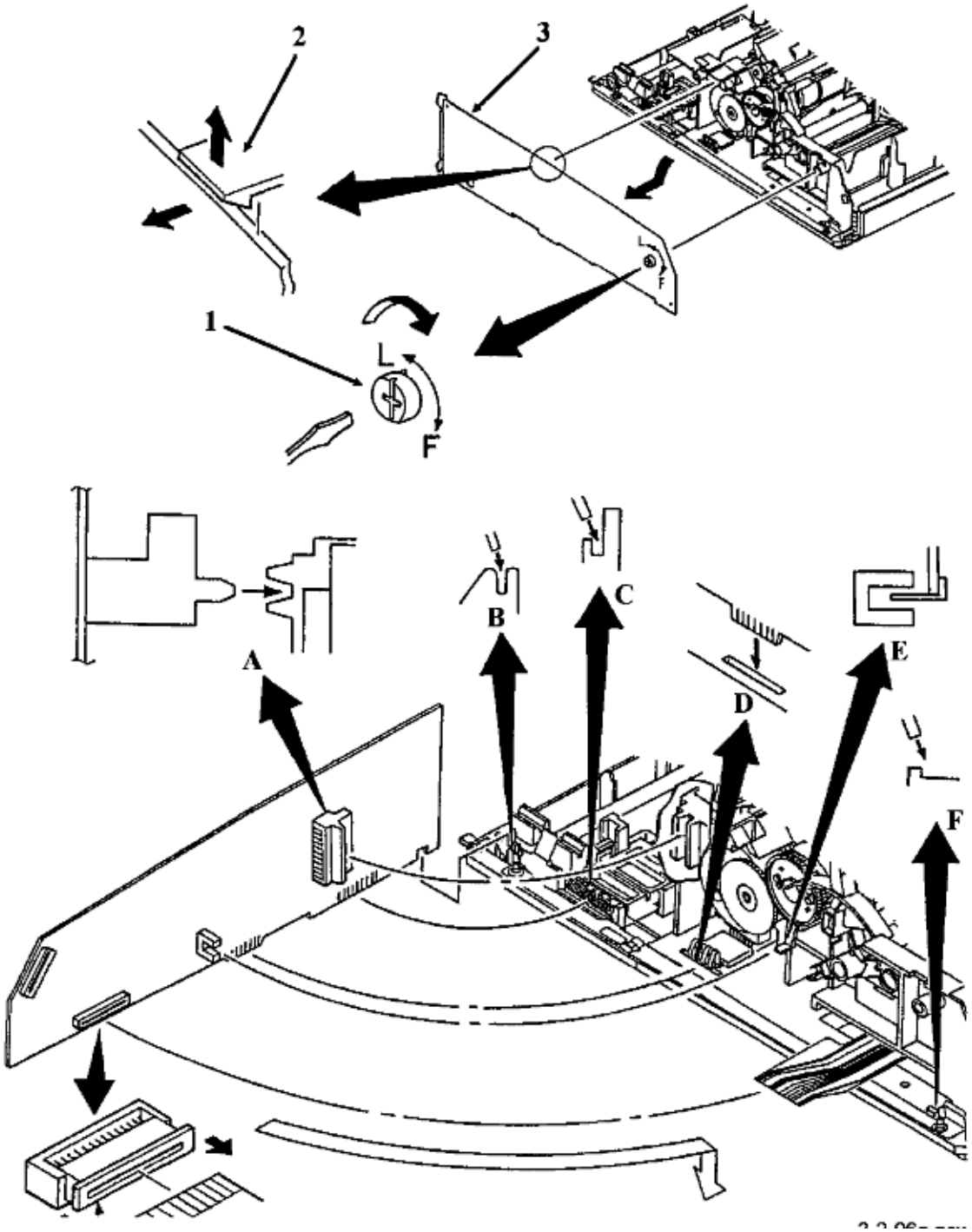
Check the contacts and connections of the control board. If good contact is not made at all connections and ground points, false diagnosis will occur.

Refer to Appendix A ( ) for detailed information regarding the differences between the Rev A, B, C, and D control boards.

Perform these procedures first:

- 3.2.01 ( )
- 3.2.04 ( )
- 3.2.05 ( )

- Turn the locking post (1) 90 degrees clockwise to unlock it.
- Lift the locking claw (2) and pull the control board (3) away from the chassis.
- Tilt the control board 45 degrees and remove it.



NOTE: When installing, verify that correct contacts are made at these points.

- Guides (A and B)
- Power Interconnect Module (C)
- Linefeed Motor Interconnect Module (D)
- Sensor Lever (E)
- Printhead Cable Connector (F)

The sensor lever must be positioned in the paper end sensor. If the lever is not correctly

positioned, the ALARM lamp will light and the unit will not automatically load paper or receive data.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50704301	Clamp: PCB	Both	RSPL	A B C D	B.2.03 04 05
P/N 55041412	PCB: LXMC-3 w/o ROM	Both	RSPL	A B C	B.2.03 04 (Control Board)
P/N 50605501	Lock: Board Screw (LXMC)	Both	RSPL	A B C D	B.2.03 04 05

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Control Board Rev C

CAUTION: Check the contacts and connections of the control board. If good contact is not made at all connections and ground points, false diagnosis will occur.

Perform these procedures first:

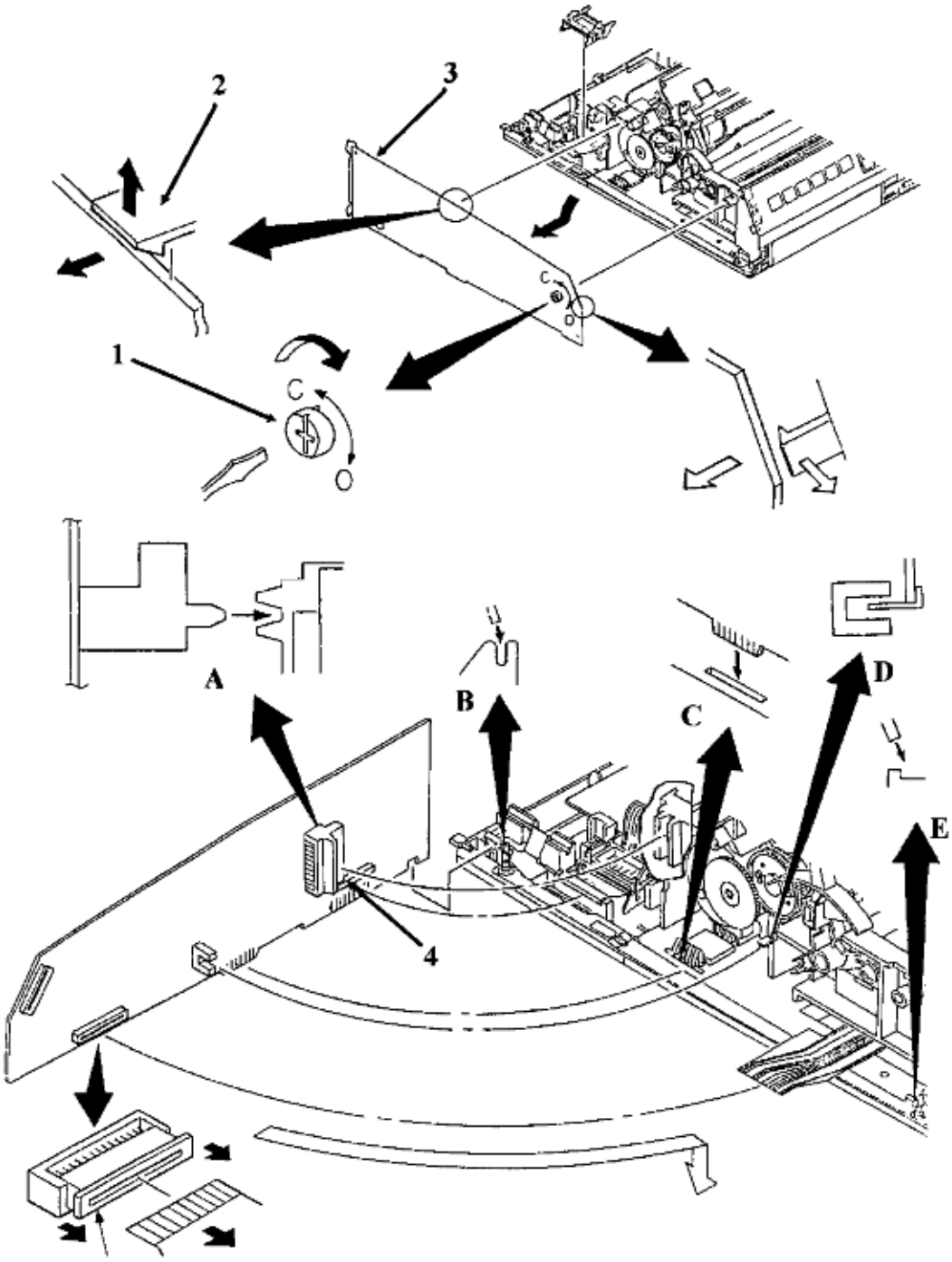
- 3.2.01 ()
- 3.2.04 ()
- 3.2.05 ()

- Turn the locking post (1) 90 degrees clockwise to unlock it.

- Lift the locking claw (2) and pull the control board (3) away from the chassis.

- Detach the cable from the connector (4).

- Tilt the control board 45 degrees and remove it.



NOTE: When installing, verify that correct contacts are made at these points.

- Guides (A and B)
- Linefeed Motor Interconnect Module (C)
- Sensor Lever (D)

- Printhead Cable Connector (E)

The sensor lever must be positioned in the paper end sensor. If the lever is not correctly positioned, the ALARM lamp will light and the unit will not automatically load paper or receive data.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50704301	Clamp: PCB	Both	RSPL	A B C D	B (Control Board) 2.03 04 05
P/N 55041412	PCB: LXMC-3 w/o ROM	Both	RSPL	A B C	B.2.03 04
P/N 50605501	Lock: Board Screw (LXMC)	Both	RSPL	A B C D	B.2.03 04 05

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Control Board (Rev D)

CAUTION: Check the contacts and connections of the control board. If good contact is not made at all connections and ground points, false diagnosis will occur.

Perform these procedures first:

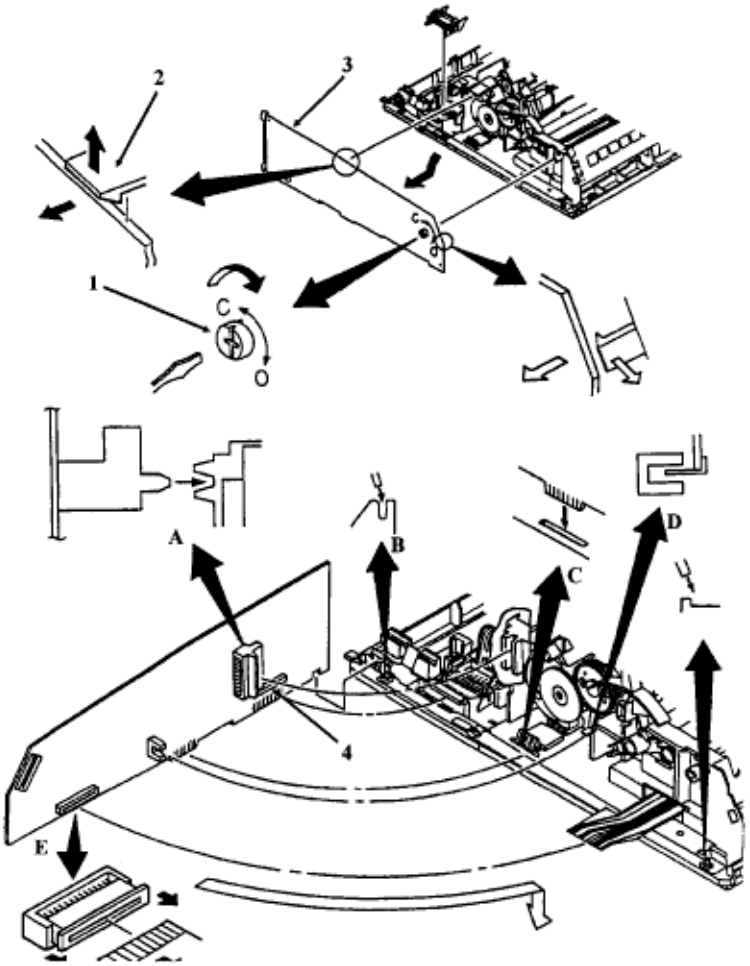
- 3.2.01 ()
- 3.2.04 ()
- 3.2.05 ()

- Turn the locking post (1) 90 degrees clockwise to unlock it.

- Lift the locking claw (2) and pull the control board (3) away from the chassis.

- Detach the cable from the connector (4).

- Tilt the control board 45 degrees and remove it.



NOTE: When installing, verify that correct contacts are made at these points.

- Guides (A and B)
- Linefeed Motor Interconnect Module (C)
- Sensor Lever (D)
- Printhead Cable Connector (E)

The sensor lever must be positioned in the paper end sensor. If the lever is not correctly positioned, the ALARM lamp will light and the unit will not automatically load paper or receive data.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50704301	Clamp: PCB	Both	RSPL	A B C D	B.2.03 04 05
P/N 50605501	Lock: Board Screw (LXMC)	Both	RSPL	A B C	B.2.03 04 05

P/N 55075111	PCB: LXMR (Assembly) SSD w/o ROMs (Control Board)	Both	RSPL	D	B.2.05`

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3.2.07 IC Card (A) Panel

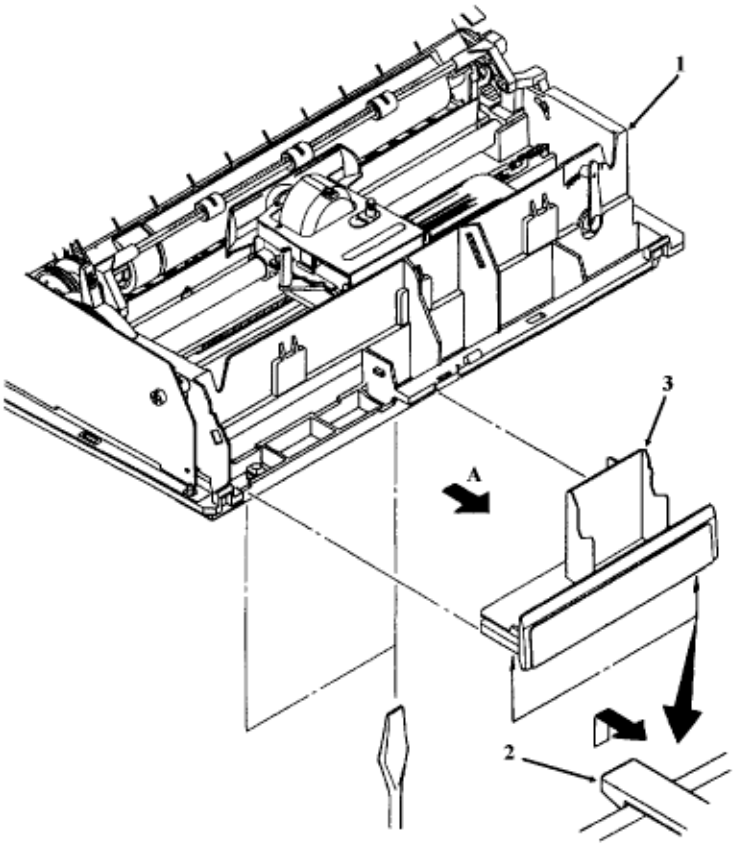
NOTE: The Rev D printers do not have this part.

Perform these procedures first:

- 3.2.01 ()
- 3.2.04 ()

- Insert a flat-blade screwdriver at the bottom of the chassis (1) and push up on the two claws (2) of the IC card (A) panel (3) to release the panel.

- Pull the panel in the direction of arrow A and remove the panel.



Part Number	Item Description	Product	Comment	Revision	App. B Reference

P/N 53494901	Panel: IC Card (A)	Both	RSPL	A B C	B.2.06 08

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3.2.08 Transformer

Revs A and B

NOTE: The transformer contains a built-in temperature fuse. Once the fuse opens, the transformer MUST be replaced.

The Rev A, B, and C transformers are NOT compatible with the Rev D transformer.

The transformer shown in the diagram is the Rev A and B transformer. This unit has been replaced by the Rev C unit, shown on the following pages.

Perform these procedures first:

- 3.2.01 ()
- 3.2.04 ()

- Disconnect the cable (1) from the filter assembly.

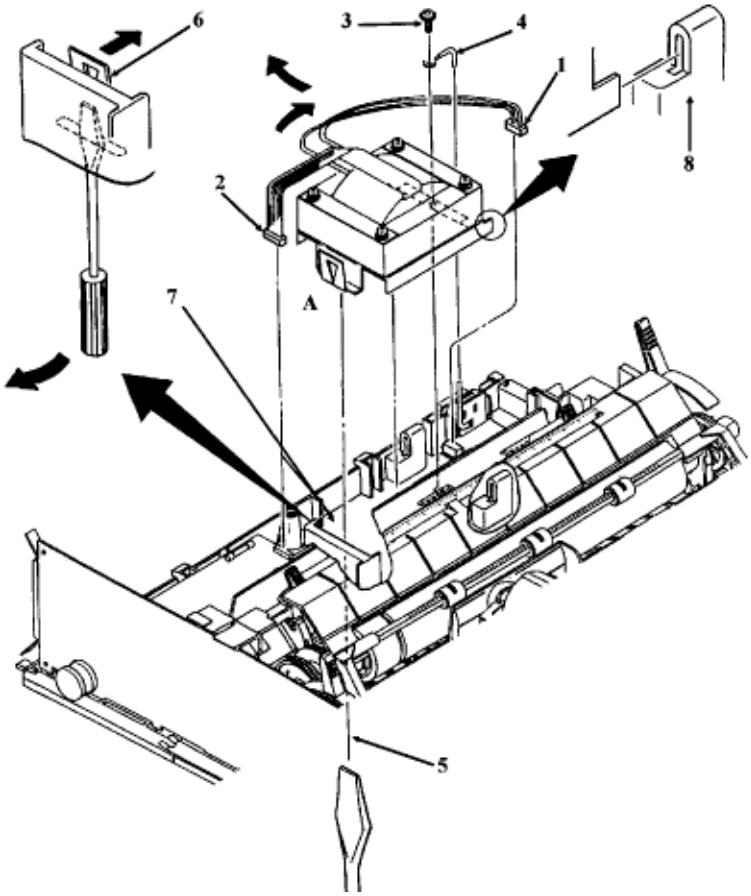
- Disconnect the cable (2) from the power supply board.

- Remove the screw (3) and detach the grounding wire (4).

- Insert a straight-slot screwdriver into the chassis from the bottom. (5 shows location)

- Push the lock spring (6) on the transformer and detach the lock spring from transformer clamp A (7).

- Lift the A side of the transformer and detach it from the transformer clamp B (8).



Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 56407503	Transformer: 120 V	320	RSPL	A B C	B.2.03 04
P/N 56407502	Transformer: 120 V	321	RSPL	A B C	B.2.03 04
P/N 56407901	Transformer: 220/240 V	320	Option RSPL	A B C	B.2.03 04
P/N 56407902	Transformer: 220/240 V	321	Option RSPL	A B C	B.2.03 04

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Transformer Rev C

NOTE: The transformer contains a built-in temperature fuse. Once the fuse opens, the transformer MUST be replaced.

The Revs A, B, and C transformers are NOT compatible with the Rev D transformer.

Perform these procedures first:

- 3.2.01 ()
- 3.2.04 ()

- Disconnect the cable (1) from the filter assembly.

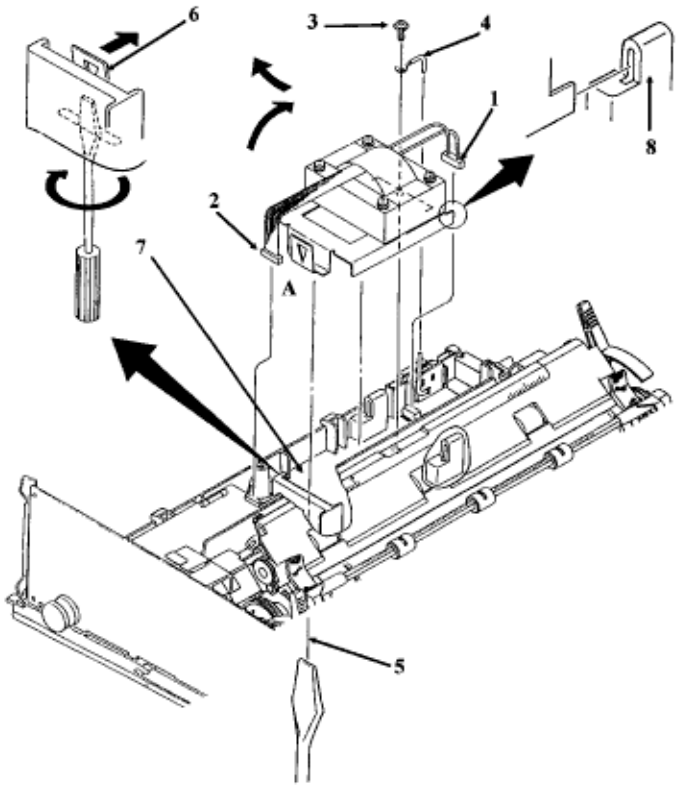
- Disconnect the cable (2) from the power supply board.

- Remove the screw (3) and detach the grounding wire (4).

- Insert a straight-slot screwdriver into the chassis from the bottom. (5 shows location)

- Push the lock spring (6) on the transformer and detach the lock spring from transformer clamp A (7).

- Lift the A side of the transformer and detach it from the transformer clamp B (8).



Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 56407503	Transformer: 120 V	320	RSPL	A B C	B.2.03 04
P/N 56407502	Transformer: 120 V	321	RSPL	A B C	B.2.03 04
P/N 56407901	Transformer: 220/240 V	320	Option RSPL	A B C	B.2.03 04
P/N 56407902	Transformer: 220/240 V	321	Option RSPL	A B C	B.2.03 04

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Transformer Rev D

NOTE: The transformer contains a built-in temperature fuse. Once the fuse opens, the transformer MUST be replaced.

The Revs A, B, and C transformers are NOT compatible with the Rev D transformer.

Perform these procedures first:

- 3.2.01 ()
- 3.2.04 ()

- Disconnect the cable (1) from the filter assembly.

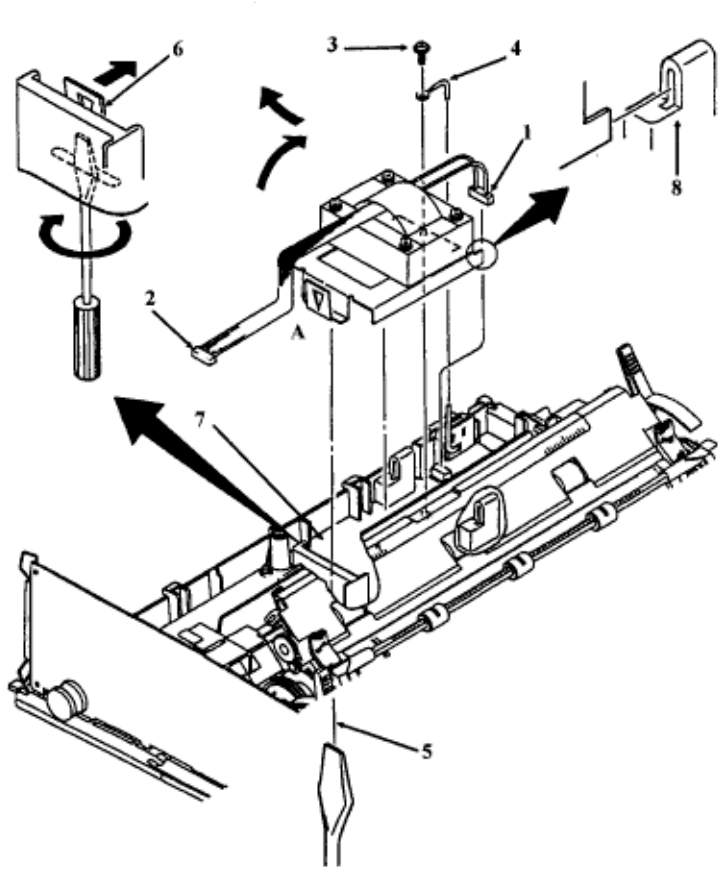
- Disconnect the cable (2) from the power supply board.

- Remove the screw (3) and detach the grounding wire (4).

- Insert a straight-slot screwdriver into the chassis from the bottom. (5 shows location)

- Push the lock spring (6) on the transformer and detach the lock spring from transformer clamp A (7).

- Lift the A side of the transformer and detach it from the transformer clamp B (8).



Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 53413201	Transformer: 120 V	SSD 320	RSPL	D	B.2.05
P/N 56413202	Transformer: 120 V	SSD 321	RSPL	D	B.2.05
P/N 56413301	Transformer: 230/240V	SSD 320	Option RSPL	D	B.2.05
P/N 56413302	Transformer: 230/240V	SSD 321	Option RSPL	D	B.2.05

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3.2.09 Filter Assembly

Perform these procedures first:

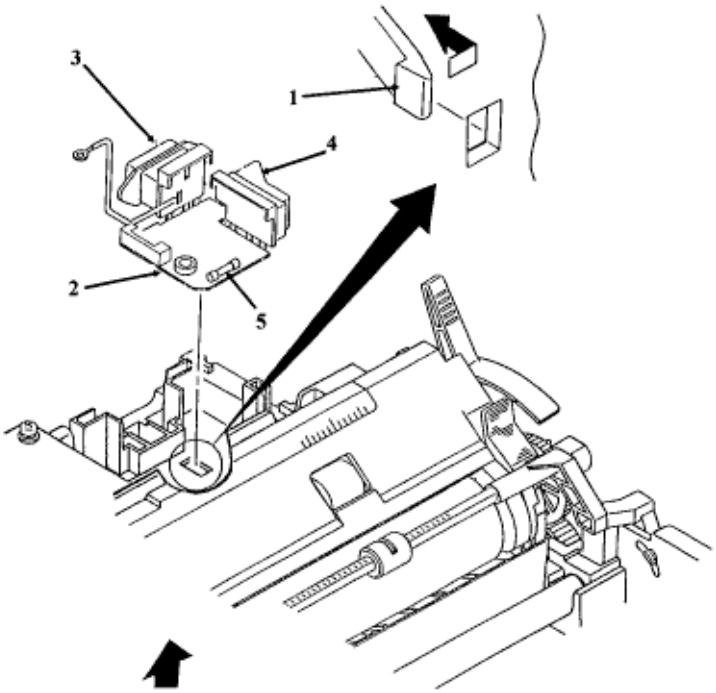
- 3.2.01 ()
- 3.2.04 ()

- Working from the bottom of the chassis, push on and release the claw (1) of the filter assembly (2).

- Lift the AC connector (3) and the AC power switch (4) from the two guides on the main frame.

- Remove the filter assembly.

- The filter assembly contains a 1.5 amp fuse (5).



Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 55503103	Filter: (Assembly)	Both	RSPL	A B C D	B.2.03 04 05 AC 120 V

P/N 55503104	Filter: (Assembly)	Both	Option	A B C D	B.2.03 04 05 AC 220/240V
P/N 56303402	Fuse: 1.5 amp 250 V	Both	Option	A B C D	B.2.03 04 05 (Filter Board)

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3.2.10 Power Supply Board

Revs A and B

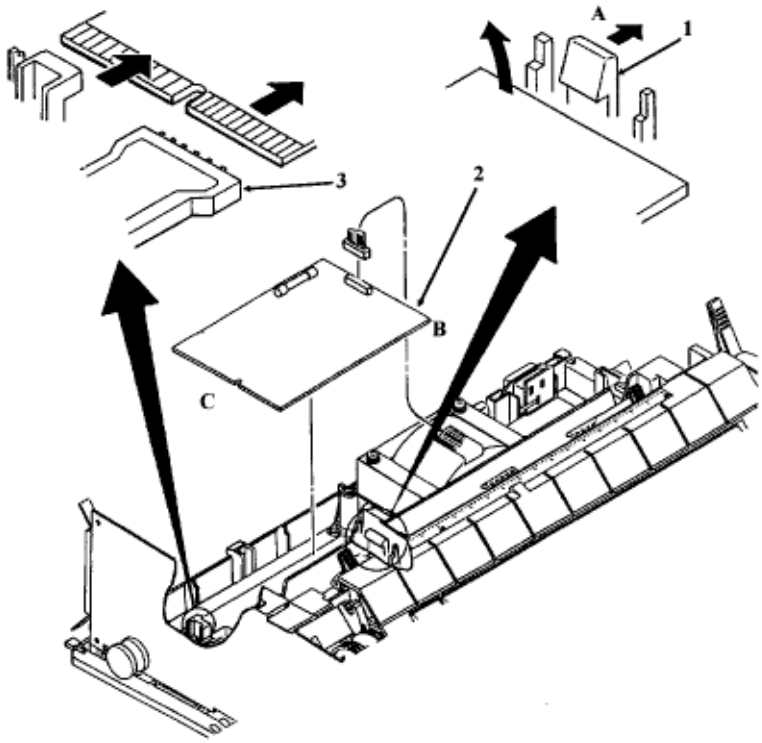
NOTES: The Rev D printers do NOT have a power supply board. The control board contains circuitry to provide the power supply function.

Refer to Appendix A for more information on this board.

Perform these procedures first:

- 3.2.01
- 3.2.04

- Push the board clamp claw (1) in the direction of arrow A.
- Lift the B side of the power supply board (2).
- Detach the C side of the power supply board from the power interconnect module (3).



Part Number	Item Description	Product	Comment	Revision	App. B Reference

P/N 55047402	PCB: SUII-2	Both	RSPL	A B C	B.2.03 04
P/N 55047406	PCB: SUII-6 (220/24V)	Both	Option	A B C	B.2.03 04
P/N 56302101	Fuse: Glass 2 amp 250V	Both	Option	A B C	B.2.03 04 (PAII or SUII Board)
P/N 56302502	Fuse: 250V 1A	Both	Option	A B C	B.2.03 04
P/N 56616802	Cable: Power Supply	Both	RSPL	C	B.2.04 Nylon Conn

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Power Supply Boards Rev C

NOTES: The Rev D printers do NOT have a power supply board. The control board contains circuitry to provide the power supply function.

Refer to Appendix A for more information on this board.

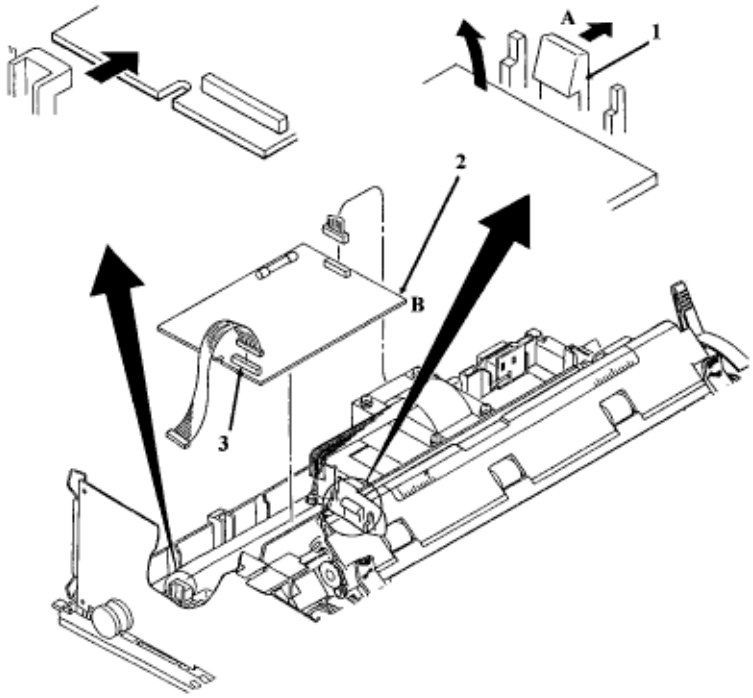
Perform these procedures first:

- 3.2.01 ()
- 3.2.04 ()

- Push the board clamp claw (1) in the direction of arrow A.

- Lift the B side of the power supply board (2).

- Detach the cable from the connector (3).



Part Number	Item Description	Product	Comment	Revision	App. B Reference

P/N 55047402	PCB: SUII-2	Both	RSPL	A B C	B.2.03 04
P/N 55047406	PCB: SUII-6 (220/24V)	Both	Option	A B C	B.2.03 04
P/N 56302101	Fuse: Glass 2 amp 250V (PAII or SUII Board)	Both	Option	A B C	B.2.03 04
P/N 56302502	Fuse: 250V 1A	Both	Option	A B C	B.2.03 04
P/N 56616802	Cable: Power Supply Nylon Conn	Both	RSPL	C	B.2.04

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3.2.11 Power Interconnect Module / Cable Guide

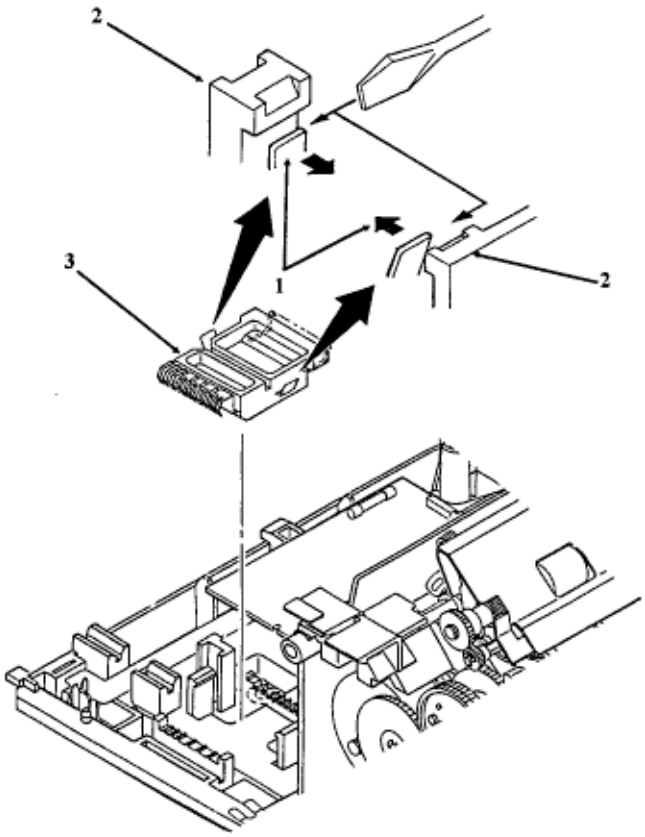
Revs A and B

NOTES: The Rev A and B printers do NOT have a cable guide.
The Rev C and Rev D printers do NOT have a power interconnect module.
Rev C and Rev D printers have a cable guide.

Perform these procedures first:
- 3.2.01 ()
- 3.2.04 ()

- Use a straight-slot screwdriver to release the claws (1) from the chassis clamps (2).

- Remove the power interconnect module (3).



Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 53328301	Module: Power Interconnect	Module: Power Inter-connect	Both	A B	B.2.06

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Power Interconnect Module / Cable Guide Rev C

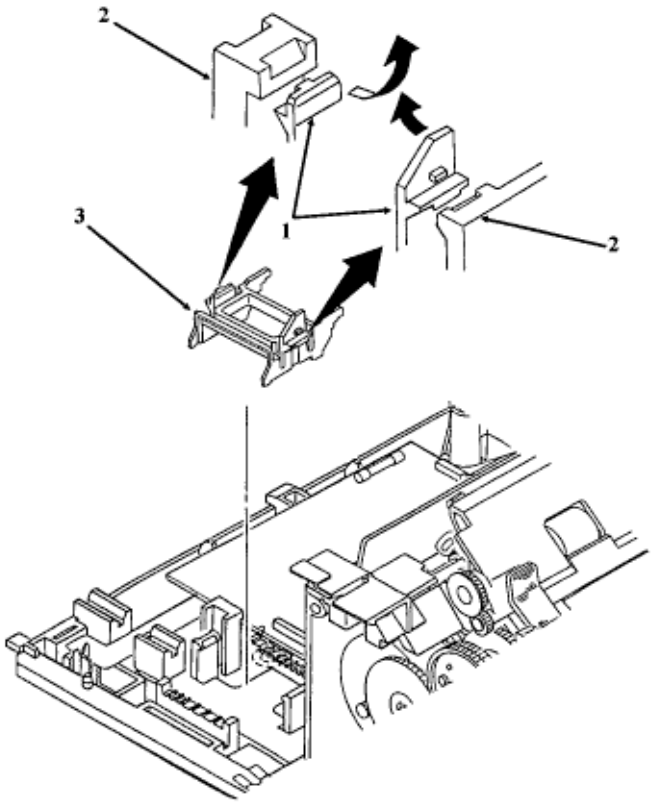
NOTES: The Rev A and B printers do NOT have a cable guide.
The Rev C and Rev D printers do NOT have a power interconnect module.
Rev C and Rev D printers have a cable guide.

Perform these procedures first:

- 3.2.01 ()
- 3.2.04 ()

- Use a straight-slot screwdriver to release the claws (1) from the chassis clamps (2).

- Remove the cable guide (3).



Part Number	Item Description	Product	Comment	Revision	App. B Reference

P/N 51003801	Guide: Cable	320	RSPL	C D	B.2.08 10

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Power Interconnect Module / Cable Guide (Rev D)

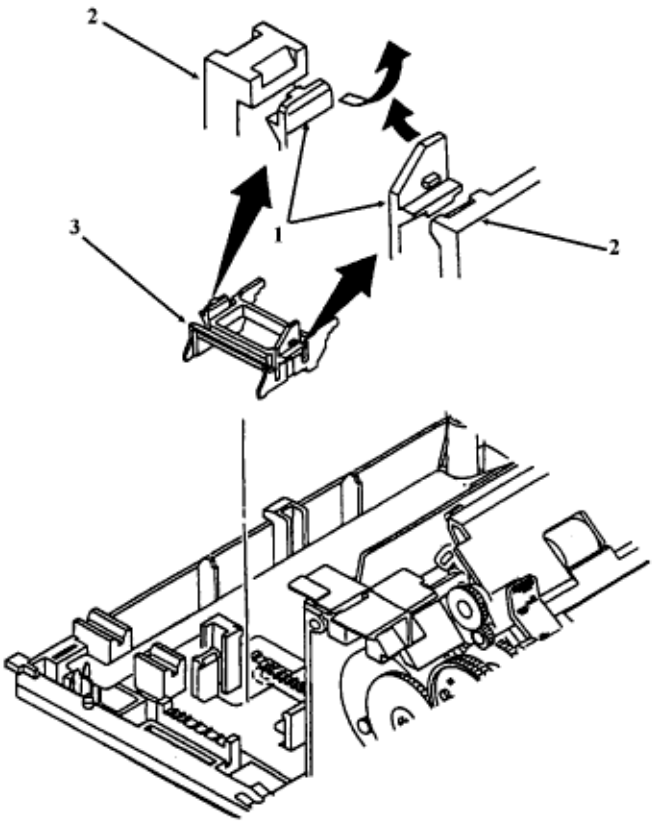
NOTES: The Rev A and B printers do NOT have a cable guide.
The Rev C and Rev D printers do NOT have a power interconnect module.
Rev C and Rev D printers have a cable guide.

Perform these procedures first:

- 3.2.01 ( )
- 3.2.04 ( )

- Use a straight-slot screwdriver to release the claws (1) from the chassis clamps (2).

- Remove the cable guide (3).



Part Number	Item Description	Product	Comment	Revision	App. B Reference

P/N 51003801	Guide: Cable	320	RSPL	C D	B.2.08 10

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3.2.12 Indicator Assembly (Bail Bar Assembly)

Perform these procedures first:

- 3.2.01 ()
- 3.2.04 ()
- 3.2.05 ()
- 3.2.06 ()

- Use needle-nose pliers to remove the left bail arm spring (1).

- Release the claw (2) and detach the left bail arm (3) from the bail bar (4).

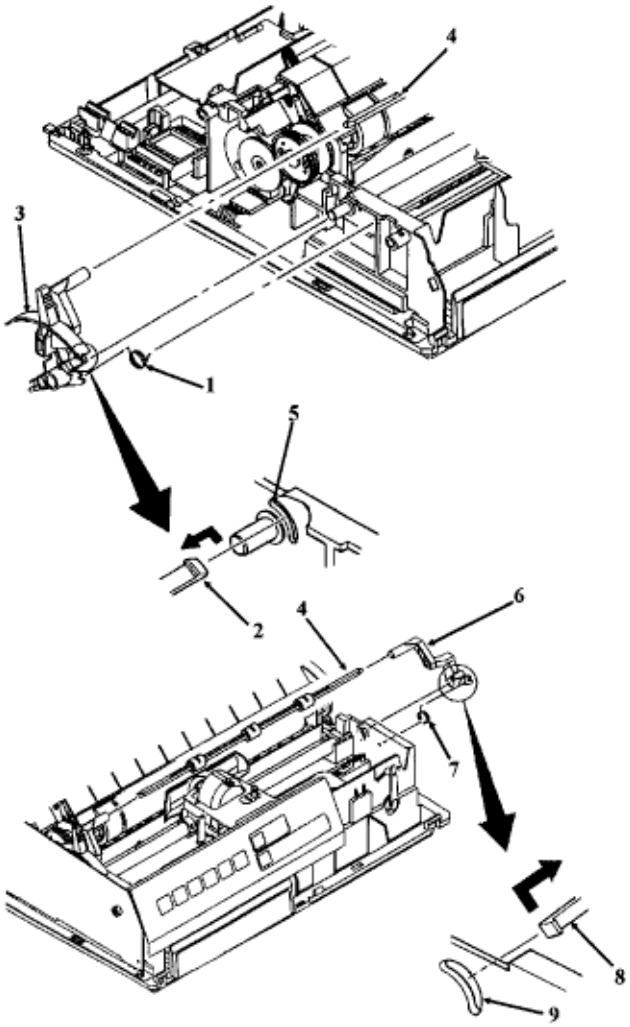
- Pull the left bail arm through the guide hole (5) in the chassis and remove the arm.

- Detach the bail bar from the right bail arm (6).

- Use needle-nose pliers to remove the right bail arm spring (7).

- Release the claw (8) and detach the right bail arm from the bail bar.

- Pull the right bail arm through the guide hole (9) in the chassis and remove the arm.



Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50911801	Spring: Bail Arm (L)	Both	RSPL	A B C D	B.2.06 08 10
P/N 53489301	Bail Arm (L)	Both	RSPL	A B C D	B.2.06 08 10
P/N 50911701	Spring: Bail Arm (R)	Both	RSPL	A B C D	B.2.06 08 10
P/N 53489201	Bail Arm (R)	Both	RSPL	A B C D	B.2.06 08 10
P/N 50061501	Indicator (Assembly)	320	RSPL	A B C D	B.2.06 08 10

P/N 50061502	Indicator (Assembly)	321	RSPL	A B C D	B.2.06 08 10

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3.2.13 Head Cable Access Cover

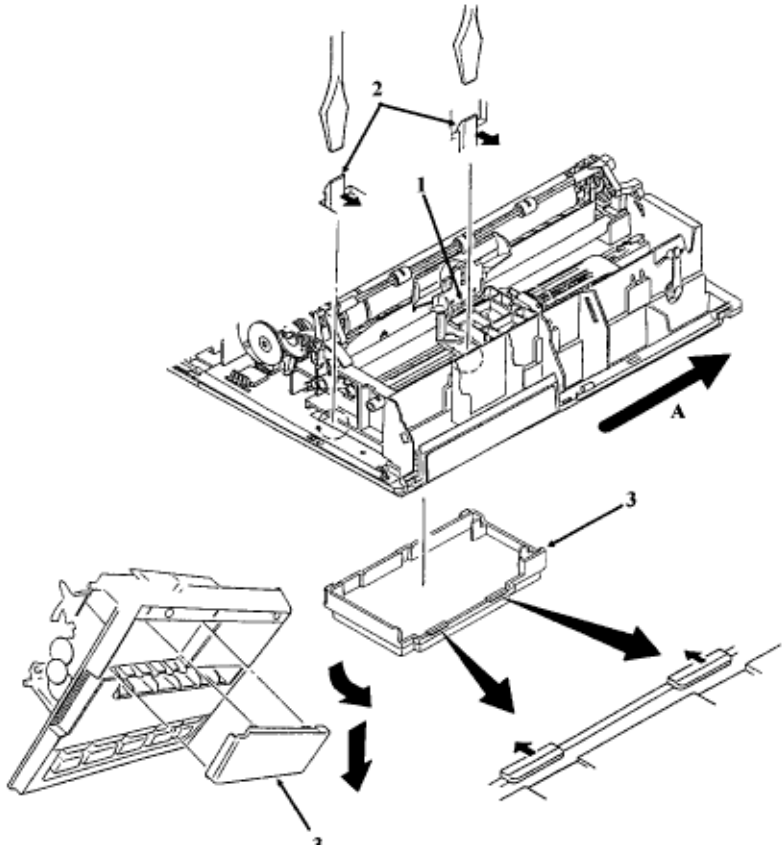
NOTE: Remove this cover to provide access when connecting the head cable to the control board.

Perform these procedures first:

- 3.2.01 ()
- 3.2.04 ()
- 3.2.06 ()

- Slide the carriage frame (1) in the direction of arrow A.

- Release the two claws (2) and remove the head cable access cover (3).



Part Number	Item Description	Product	Comment	Revision	App. B Reference

P/N 50062301	Cover: Head Cable Access	Both	RSPL	A B C	B.2.06 08

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3.2.14 Ribbon Drive Assembly

CAUTION: When handling the head cable, do NOT bend the cable at sharp angles or you may damage it.

Perform these procedures first:

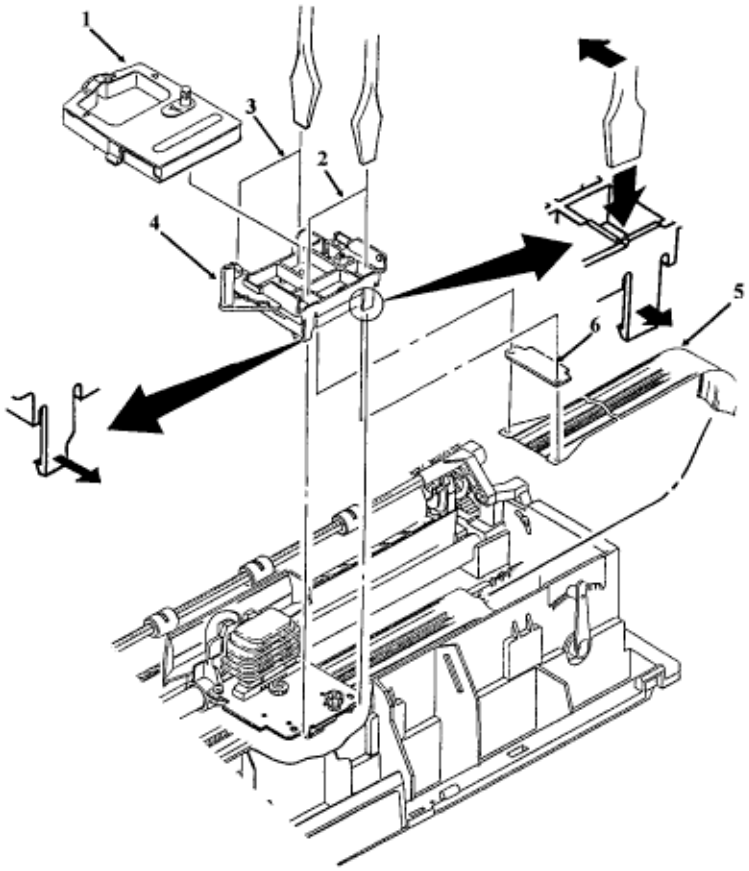
- 3.2.01 ()
- 3.2.04 ()

- Remove the ribbon (1).

- Insert a straight-slot screwdriver through the access slots and release the two front claws (2) and the two rear claws (3) of the ribbon drive assembly (4).

- Lift and remove the assembly.

- Detach the head cable (5), the cable clamp (not shown) and the contact pressure rubber (6) from the drive assembly.



When lubricating, refer to Section 3.5 of this Service Handbook.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50063701	Drive: Ribbon Assembly	Both	RSPL	A B C D	B.2.13
P/N 56616301	Cable: Head (Flexible)	320	RSPL	A B C D	B.2.13
P/N 56616302	Cable: Head (Flexible)	321	RSPL	A B C D	B.2.13
P/N 51706501	Rubber: Contact Pressure	Both	RSPL	A B C D	B.2.13

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3.2.15 Space Motor Assembly

Perform these procedures first:

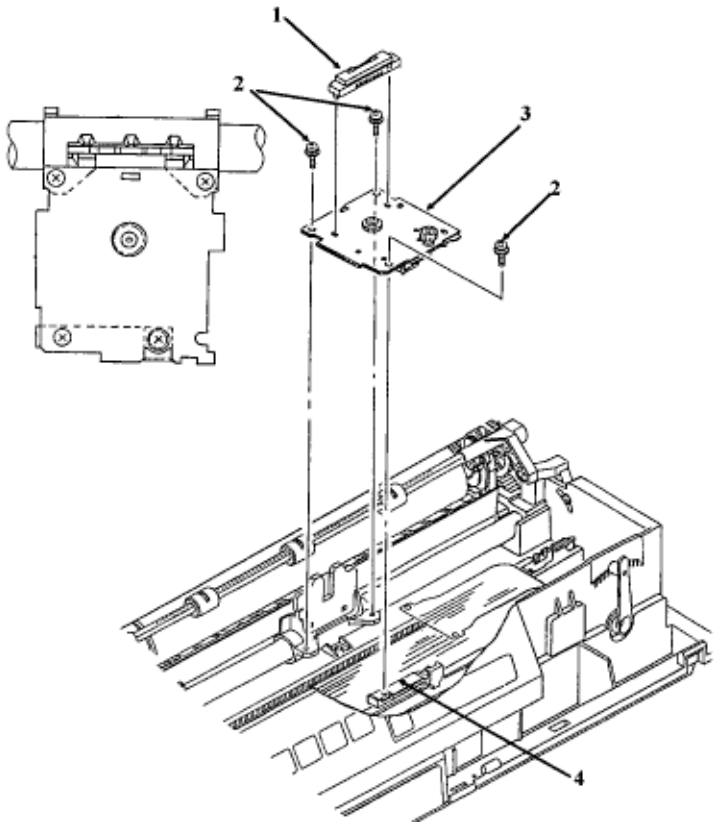
- 3.2.01 ()
- 3.2.03 ()
- 3.2.04 ()
- 3.2.14 ()

- Note the position of the connector (1). During assembly, the connector's orientation is critical for correct printhead operation.

- Detach the connector.

- Remove the three mounting screws (2).

- Remove the space motor assembly (3). Be careful not to lose the slider (4).



NOTES:

Installation

- Do not touch the contacts of the assembly.

- Position the slider first.

- The contact side of the head cable faces down when the carriage cable is inserted into the connector on the space motor assembly.

- Work the cable from side to side until it is fully seated in the connector. No contacts should be visible.

- Perform the printhead gap adjustment after installing this assembly.

Refer to Section 3.3 of this Service Handbook.

Cleaning

When cleaning, refer to Section 3.4 () of this Service Handbook.

Lubrication

When lubricating, refer to Section 3.5 () of this Service Handbook.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 51001801	Guide: Space Motor (Slider)	Both	RSPL	A B C D	B.2.13
P/N 56718601	Connector: Head	Both	RSPL	A B C D	B.2.13
P/N 56507202	Motor: Space (Assembly)	Both	RSPL	A B C D	B.2.13

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3.2.16 Carriage Frame Assembly

Perform these procedures first:

- 3.2.01 ()
- 3.2.03 ()
- 3.2.04 ()
- 3.2.14 ()
- 3.2.15 ().

- Detach the head clamp (1).

- Use a flat-blade screwdriver to release the tabs of the ribbon protector (2).

- Remove the ribbon protector.

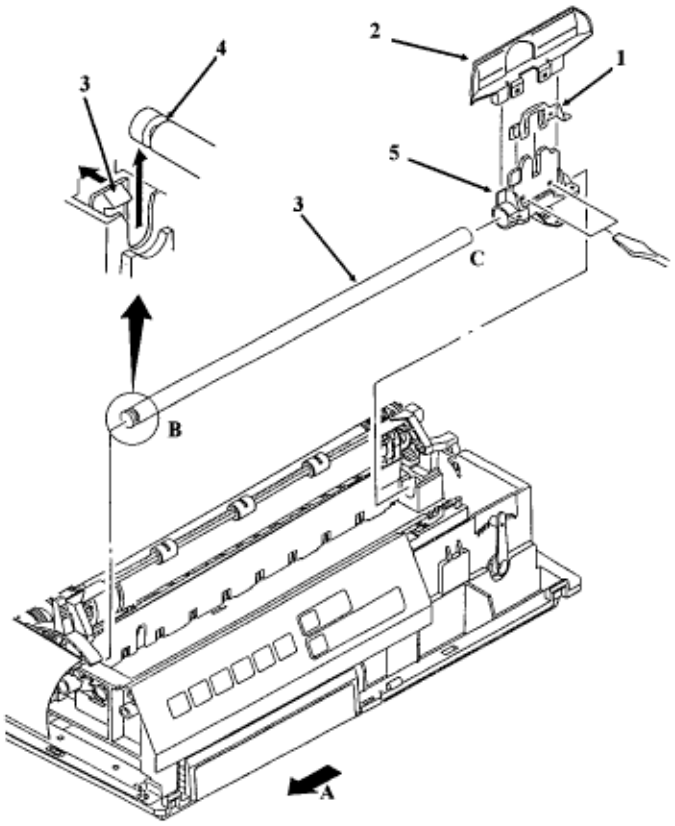
- Push the carriage shaft clamp (3) in the direction of arrow A.

- Lift the carriage shaft (4) at position B.

- Remove the carriage shaft from the guide hole by pulling at position C.

- Remove the carriage shaft, with the carriage frame (5).

- Slide the carriage frame off the carriage shaft.



NOTES:

Installation

- After installing the carriage shaft, check the printhead gap adjustment.

Refer to Section 3.3 of this Service Handbook.

Cleaning

When cleaning, refer to Section 3.4 of this Service Handbook.

Lubrication

When lubricating, refer to Section 3.5 ( ) of this Service Handbook.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 51109401	Shaft: Carriage	320	RSPL	A B C D	B.2.06 08 10

P/N 51109402	Shaft: Carriage	321	RSPL	A B C D	B.2.06 08 10
P/N 50702901	Clamp: Head	Both	RSPL	A B C D	B.2.13
P/N 53490401	Frame: Carriage (Assembly)	Both	RSPL	A B C D	B.2.13
P/N 53056201	Protector: Ribbon	Both	RSPL	A B C D	B.2.13

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3.2.17 Space Rack

Perform these procedures first:

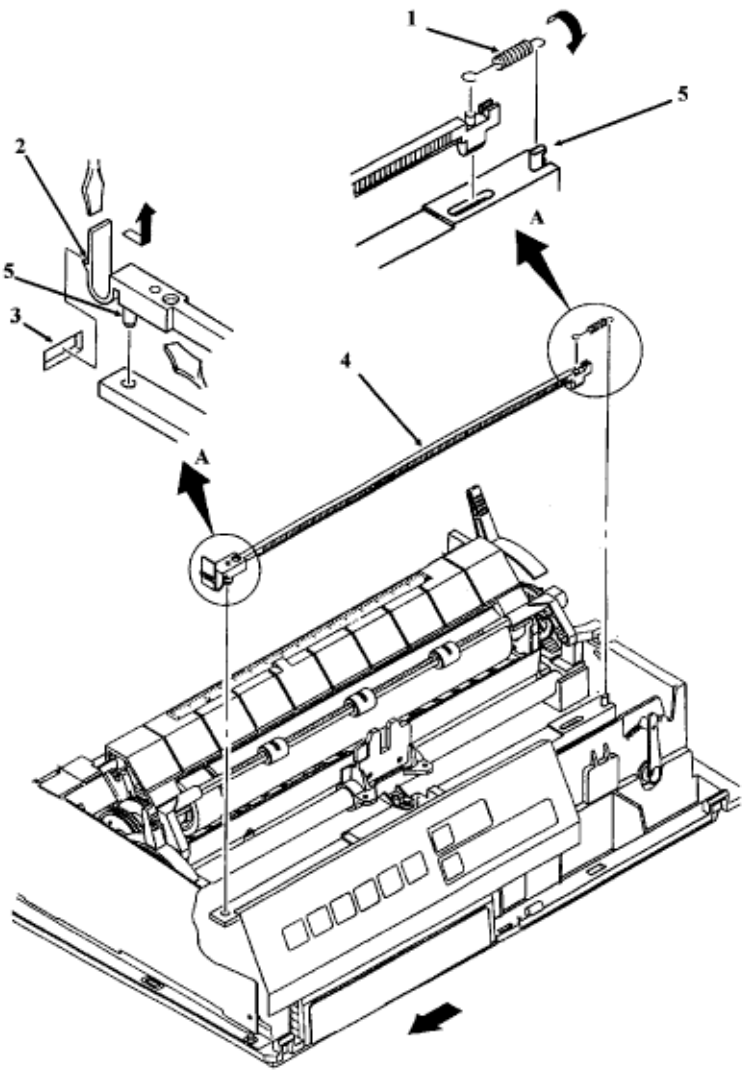
- 3.2.01 ()
- 3.2.04 ()
- 3.2.14 ()
- 3.2.15 ().

- Remove the tension spring (1).

- Release the claw (2) from the hole (3) in the chassis.

- Pull the space rack (4) in the direction of arrow A.

- Remove the space rack.



NOTES:

Installation

- Fully seat the two guide pins (5).

Cleaning

- When cleaning, refer to Section 3.4 of this Service Handbook.

CAUTION: Do NOT lubricate the space rack. Lubricating the space rack will attract dust. If enough dust accumulates on the space rack, printing problems will occur.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 53489401	Rack: Space	320	RSPL	A B C D	B.2.06 08 10
P/N 53489402	Rack: Space	321	RSPL	A B C D	B.2.06 08 10
P/N 50911901	Spring: Tension	Both	RSPL	A B C D	B.2.06 08 10

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3.2.18 Guide Rail

Perform these procedures first:

- 3.2.01 ()
- 3.2.04 ()
- 3.2.14 ()
- 3.2.15 ().

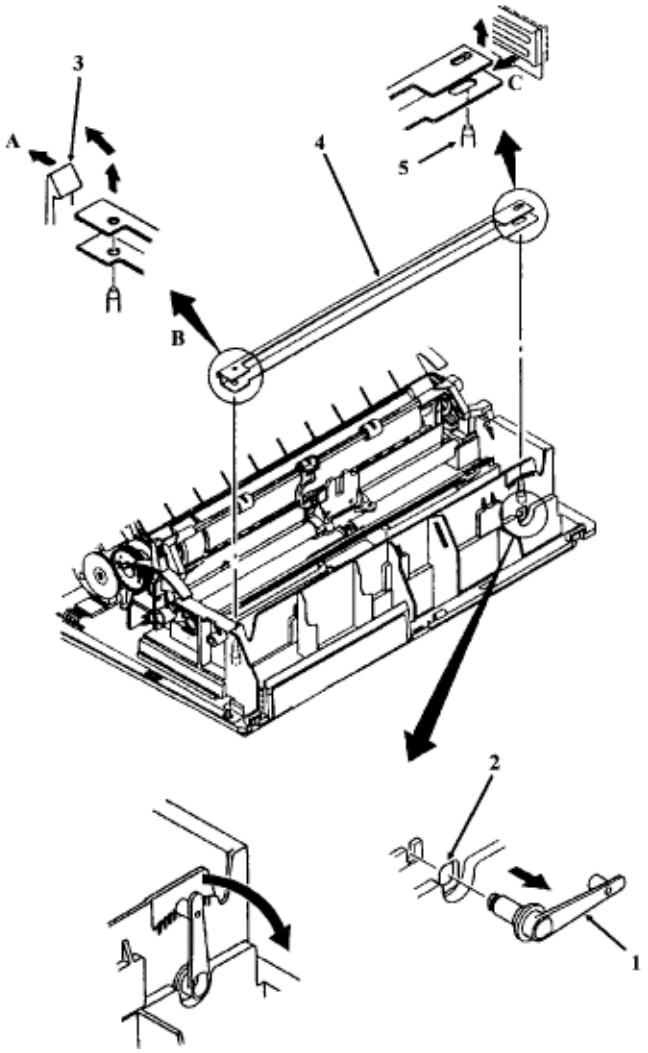
- Pull the adjusting cam (1) out and rotate it to the horizontal position.

- Release the adjusting cam from the guide (2) in the chassis and remove the cam.

- Push the claw (3) in the direction of arrow A to disengage the guide rail (4) at position B.

- Pull the guide rail in the direction of arrow C to release it from the guide (5) in the chassis.

- Lift and remove the guide rail.



NOTE: After installing the guide rail, check the printhead gap adjustment.
Refer to Section 3.3 of this Service Handbook.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 51002101	Rail: Guide	320	RSPL	A B C D	B.2.06 08 10
P/N 51002102	Rail: Guide	321	RSPL	A B C D	B.2.06 08 10
P/N 51216201	Cam: Adjust	Both	RSPL	A B C D	B.2.06 08 10

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3.2.19 Platen Assembly

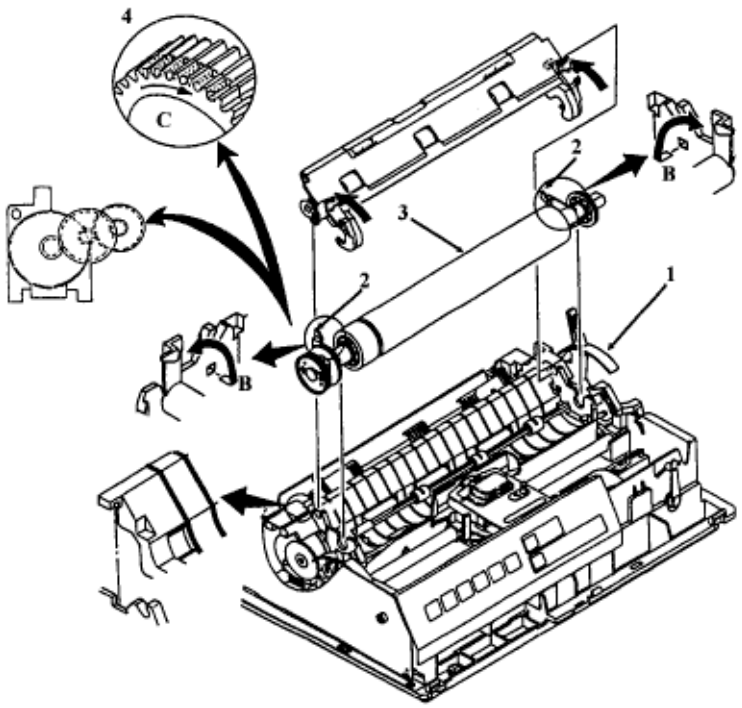
Perform these procedures first:
- 3.2.01 ()
- 3.2.02 ()
- 3.2.04 ()

- Push the release lever (1) to the rear of the printer.

- Pull the platen lock levers (2) in the direction of arrow A.

- Rotate the lock levers in the direction of arrow B. This releases the platen assembly (3) from the chassis.

- Lift and remove the platen assembly.



NOTES:

Installation

- Before installation, turn the bias gear (4) towards the front of the printer as far as it will go.

- Set the platen assembly into place.

- Verify that the bias gear securely engages the line feed motor gear.

- Secure the two lock levers.

- Set the release lever to OPEN (front) and check that the groove of the paper chute firmly engages with the groove of the main chassis.

- **Check the printhead gap adjustment. Refer to Section 3.3 of this Service Handbook.**

Cleaning

When cleaning, refer to Section 3.4 of this Service Handbook.

Lubrication

When lubricating, refer to Section 3.5 of this Service Handbook.
Do NOT lubricate the line feed motor gear. Lubricant will cause the gear to disintegrate.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50061305	Platen: (Assembly)	320	RSPL	A B C D	B.2.06 08 10
P/N 50061306	Platen: (Assembly)	321	RSPL	A B C D	B.2.06 08 10

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3.2.20 Line Feed Motor and Gear

Line Feed Motor

NOTES: Use care when performing this procedure. The plastic claws will break if too much pressure is applied.

If the line feed motor gear breaks or becomes worn, it is not necessary to replace the entire line feed motor assembly. The gear (6) can be replaced without removing the line feed motor assembly. However, the platen assembly MUST be removed. The line feed idle gear should be removed ONLY if it must be replaced. The claws will break when the gear is removed. A new gear must be installed.

Perform these procedures first:

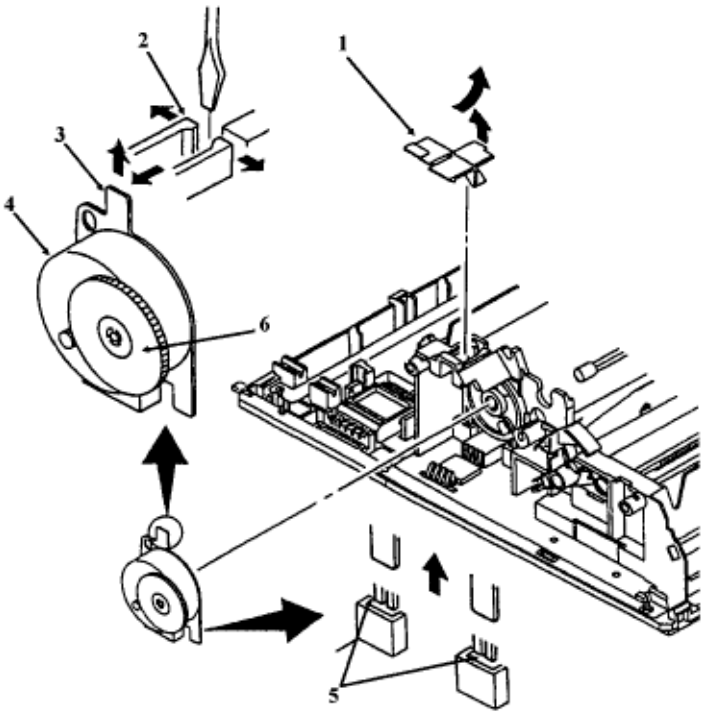
- 3.2.01 ()
- 3.2.02 ()
- 3.2.04 ()
- 3.2.05 ()
- 3.2.06 ()
- 3.2.19.()

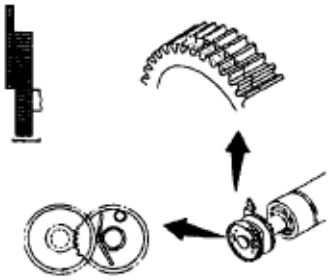
- Remove the left bail arm.

- Use a straight slot screwdriver to remove the clip (1).

- Use a straight slot screwdriver to open the lock levers (2) and push the bracket (3) of the line feed motor (4) in the direction of arrow A.

- Remove the line feed motor from the guides (5).





CAUTION:

Installation

If the line feed motor assembly is not correctly installed, excessive wear of the platen gears will occur.

Verify that the tabs are not bent. If the tabs are bent, straighten them. The assembly will not seat if the tabs are bent. If the assembly is not seated correctly, the gears will not correctly align.

Rotate the bias gear towards the front of the printer as far as the gear will turn. This aligns the bias gear with the platen gear.

Set the platen assembly in place, securely engaging the idler gear with the platen gears.

Lock the line feed motor assembly into position. Verify that the tabs are not bent.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 56507003	Motor: Line Feed	Both	RSPL	A B C D	B.2.07 09 11

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Line Feed Motor Gear

NOTES: If the line feed motor gear breaks or becomes worn, it is not necessary to replace the entire line feed motor assembly. The gear can be replaced without removing the line feed motor assembly. However, the platen assembly MUST be removed. The line feed idle gear should be removed ONLY if it must be replaced. The claws will break when the gear is removed. Anew gear must be installed.

Perform these procedures first:

- 3.2.01 ()
- 3.2.02 ()
- 3.2.04 ()
- 3.2.05 ()
- 3.2.06 ()
- 3.2.19.()

- Remove the left bail arm.

- Use a small cutting pliers to cut the three claws (1) that secure the line feed motor gear (2) to the support shaft (3).

- Remove the gear and cut claws.

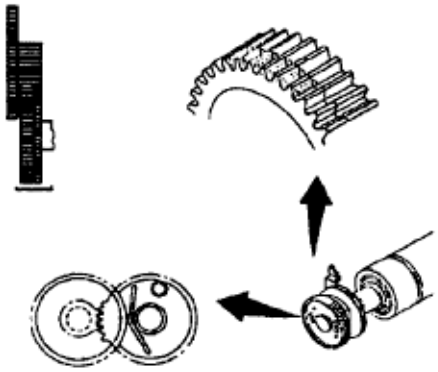
- Apply one drop of machine oil to the support shaft.

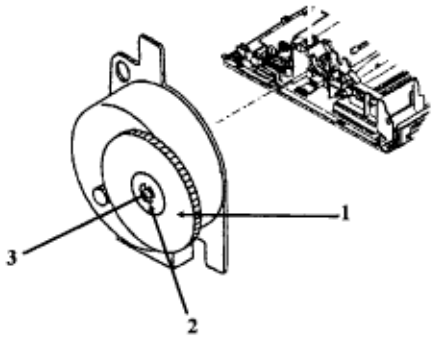
- Slide the new gear onto the support shaft.

- Lock the three claws of the gear into the groove of the shaft.

- Rotate the bias gear towards the front of the printer as far as the gear will turn. This aligns the bias gear with the platen gear.

- Set the platen assembly in place, securely engaging the line feed motor gear with the platen gears.





CAUTION:

If the claws do not lock into the groove of the support shaft, the gear will "walk" off the shaft during use. Verify that the line feed motor gear and line feed motor assembly are correctly installed. Verify that the line feed motor gear and the platen gears are correctly aligned. Incorrect installation and alignment will cause line feed motor gear breakage and wearing.

Do NOT apply lubricant to the teeth of the line feed motor gear. Grease causes the plastic to break down, resulting in premature wear of the gear teeth.

Part Number	**Item Description**	**Product**	**Comment**	**Revision**	**App. B Reference**
P/N 51219001	Gear: Line Feed Motor	Both	RSPL	A B C D	B.2.07 09 11
P/N 58217901	***Field Change Order 7677A Kit**	Both		A B	

* Contains a strengthened line feed motor gear and installation instructions.

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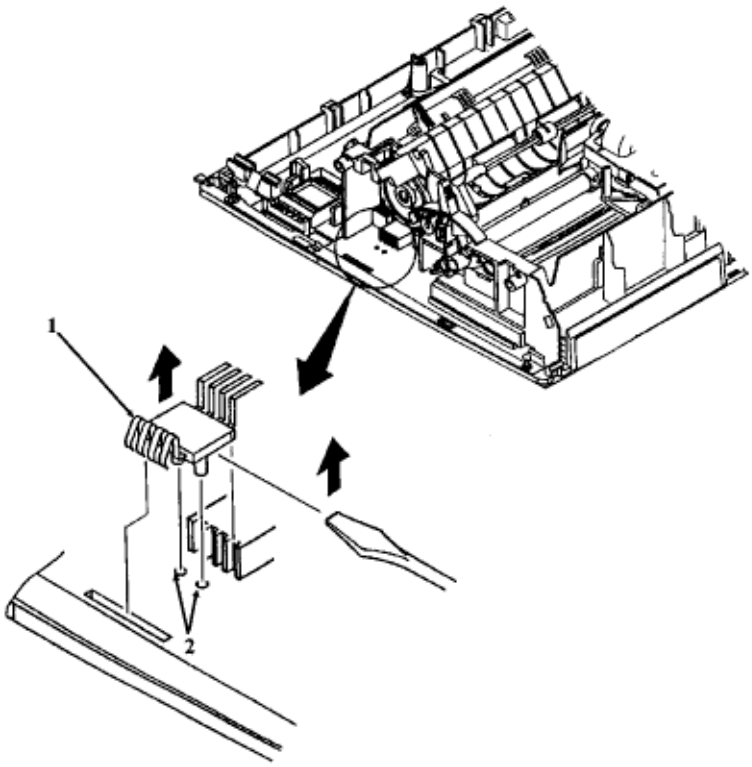
3.2.21 Line Feed Motor Interconnect Module

NOTE: Use care when performing this procedure. The plastic extension will break if too much pressure is applied.

Perform these procedures first:

- 3.2.01 ()
- 3.2.02 ()
- 3.2.04 ()
- 3.2.05 ()
- 3.2.06 ()
- 3.2.20 ()

- Insert a straight-slot screwdriver between the line feed motor interconnect module (1) and the chassis. Then, carefully pry the module from the two guide holes (2).



Part Number	Item Description	Product	Comment	Revision	App. B Reference

P/N 53328401	Module: LF Motor Interconnect	Both	RSPL	A B C D	B.2.07 09 11

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3.2.22 Reset Spring, Change Gear, and Idler Gear

CAUTION:
- Please read through this entire procedure before performing it.
- Do NOT press against the vertical extension of the reset spring at any time during this procedure.
- Firm pressure will release the reset spring, NOT brute force.

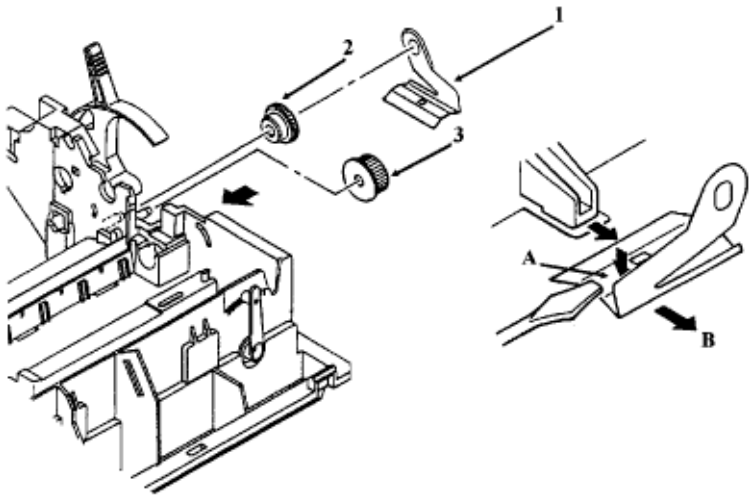
Perform these procedures first:
- 3.2.01 ()
- 3.2.02 ()
- 3.2.04 ()

- Use a flat-blade screwdriver to press down at position A of the reset spring (1).

- Slide the spring out in the direction of arrow B.

- Detach the change gear (2).

- Detach the idler gear (3).



NOTE:

Lubrication

When lubricating, refer to Section 3.5 of this Service Handbook.

Parts Replacement

The Kit: Idler/Change Gear (ML300) includes the change and idler gears. Order

this kit when replacing these parts.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50912001	Spring: Reset	Both	RSPL	A B C D	B.2.07 09 11
P/N 58227501	Kit: Idler/Change Gear (ML300) Includes the Change Gear and the Idler Gear	Both	RSPL	A B C D	B.2.07 09 11
P/N 51215901	Change Gear Included in the Idler/Change Gear Kit	Both		A B C D	B.2.07 09 11
P/N 51216001	Idler Gear Included in the Idler/Change Gear Kit	Both		A B C D	B.2.07 09 11

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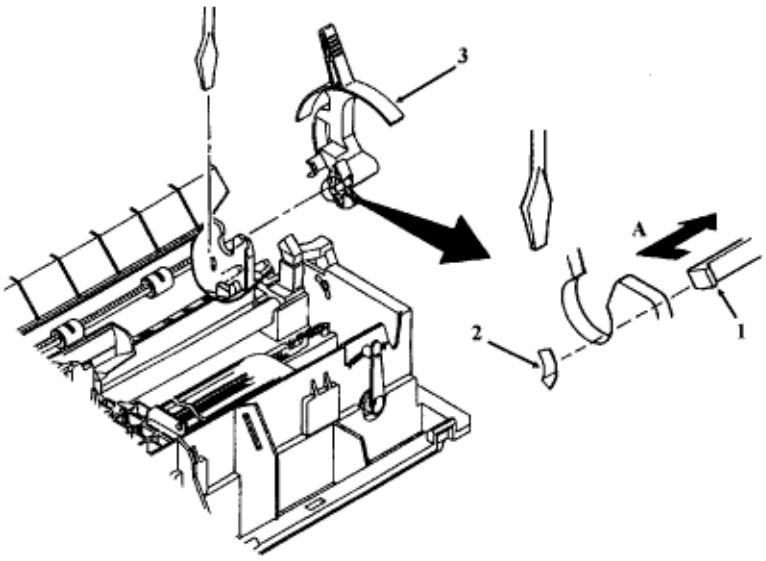
3.2.23 Release Lever

Perform these procedures first:

- 3.2.01 ()
- 3.2.02 ()
- 3.2.04 ()
- 3.2.22 ()

- Release the claw (1) from the guide (2) in the chassis.

- Pull the release lever (3) in the direction of arrow A and remove the lever.



Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 53489501	Lever: Release	Both	RSPL	A B C D	B.2.07 09 11

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3.2.24 Paper Pressure Guide

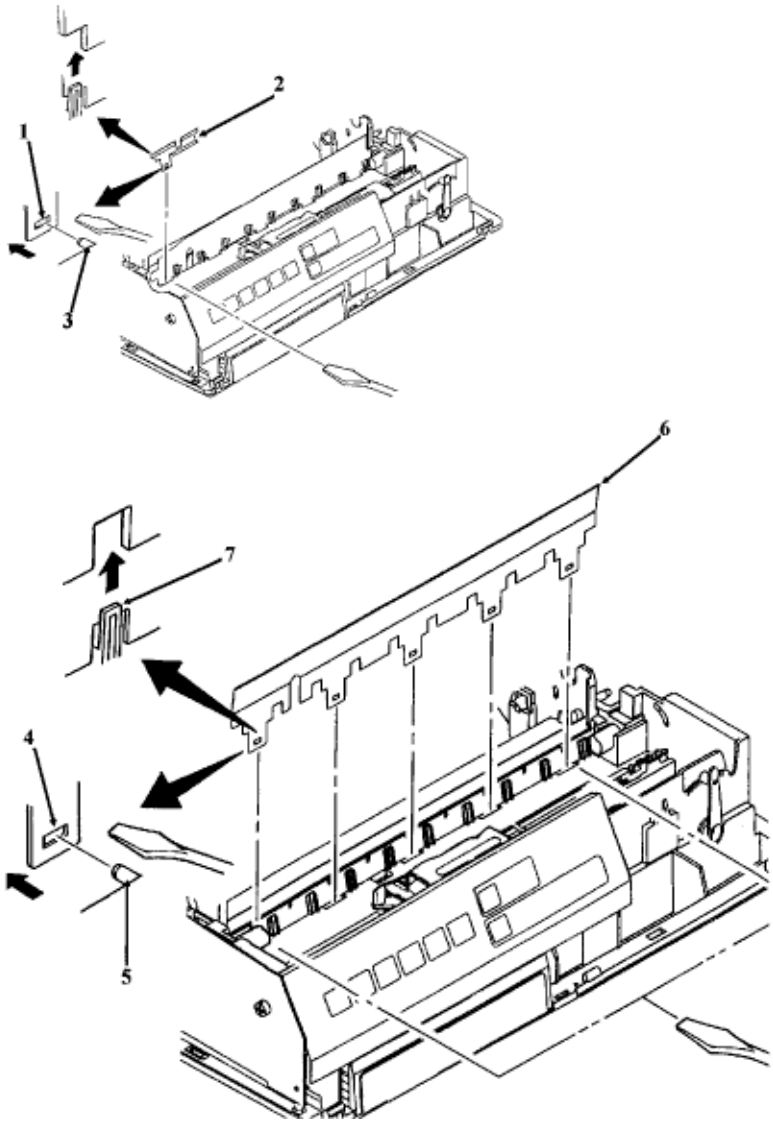
Perform these procedures first:

- 3.2.01 ()
- 3.2.02 ()

- Use a straight-slot screwdriver to detach the coupling holes (1) of the support spring (2) from the projections (3) on the main chassis. (Microline 321 ONLY)

- Work from left to right and use a straight-slot screwdriver to detach the coupling holes (4) from the projections (5) on the chassis.

- Remove the paper pressure guide (6).



NOTE:

When installing the paper pressure guide, be sure to fit it into the projections (5) and guide plates (7) at the same time.

The Microline 320 has five coupling holes and ten guide plates.

The Microline 321 has seven coupling holes and thirteen guide plates.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50911501	Guide: Paper Pressure	320	RSPL	A B C D	B.2.07 09 11

P/N 50911602	Guide: Paper Pressure	321	RSPL	A B C D	B.2.07 09 11
P/N 50913901	Spring: Support	321	RSPL	A B C D	B.2.07 09 11

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3.2.25 Pressure Roller Assembly

Perform these procedures first:

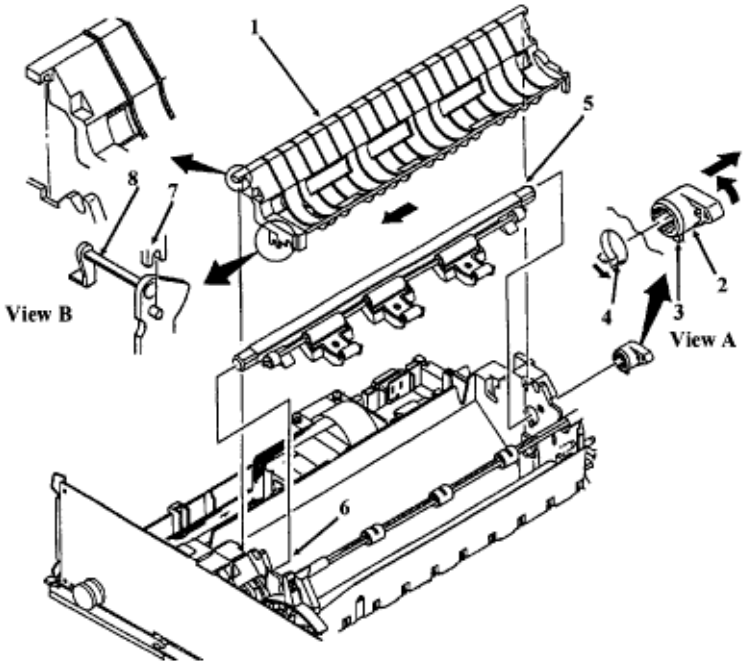
- 3.2.01 ()
- 3.2.02 ()
- 3.2.04 ()
- 3.2.22 ()
- 3.2.23 ()

- Remove the paper chute (1).

- Turn the release link (2) as shown in View A so the spine (3) is aligned with the slot (4) in the guide hole.

- Slide the release link off the pressure roller assembly (5).

- Remove the pressure roller assembly by sliding it through the guide hole (6).



NOTES:

Installation

Attach the paper end lever (7) to the shaft of the sensor lever (8). Refer to View B for the correct position. If the paper end lever is incorrectly positioned, paper jams / no paper-end indications will occur.

Position the tab of the paper chute firmly with the groove of the main frame.

Engage the cut-sheet paper end lever (attached to the bottom of the paper chute) to the bottom paper end lever (under the main frame). Then, install the paper chute.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50061801	Chute: Paper (Assembly)	320	RSPL	A B C D	B.2.07 09 11
P/N 50061901	Chute: Paper (Assembly)	321	RSPL	A B C D	B.2.07 09 11
P/N 50061601	Roller: Pressure (Assembly)	320	RSPL	A B C D	B.2.07 09 11
P/N 50061701	Roller: Pressure (Assembly)	321	RSPL	A B C D	B.2.07 09 11
P/N 53489601	Link: Release	Both	RSPL	A B C D	B.2.07 09 11

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